



3 1604 019 981 820

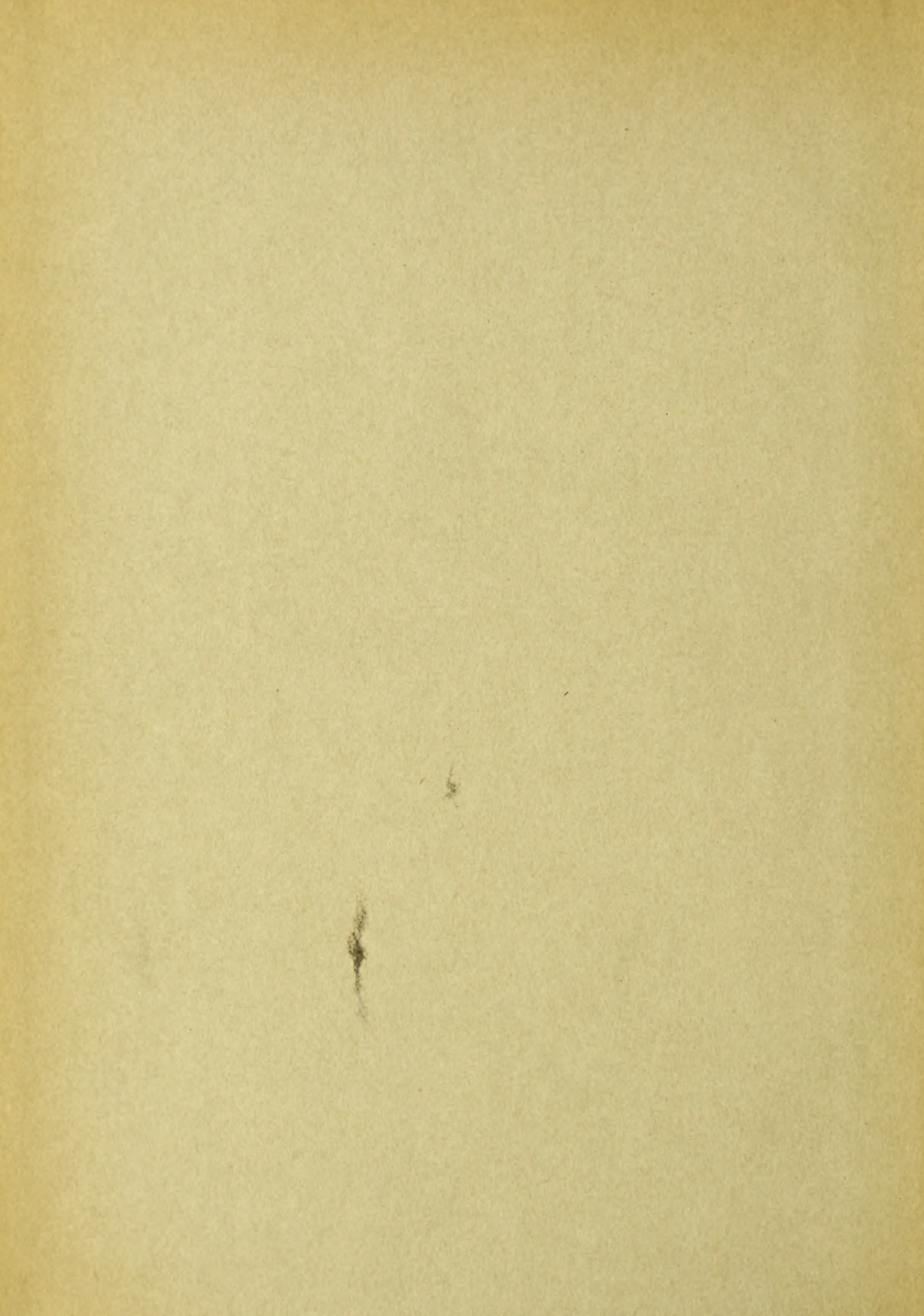
















Digitized by the Internet Archive  
in 2013







THE INSECT PEST SURVEY  
BULLETIN

112  
AGRICULTURAL REFERENCE DEPARTMENT  
CLEMSON COLLEGE LIBRARY

---

Volume 16

March 1, 1936

to

December 20, 1936

---

BUREAU OF  
ENTOMOLOGY AND PLANT QUARANTINE  
UNITED STATES  
DEPARTMENT OF AGRICULTURE  
AND  
THE STATE ENTOMOLOGICAL  
AGENCIES COOPERATING







# I N S E C T P E S T S U R V E Y B U L L E T I N

Vol. 16

March 1, 1936

No. 1

## REPORTERS FOR THE INSECT PEST SURVEY

United States	The Entomologists of the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture
Alabama	Dr. J. M. Robinson, Alabama Polytechnic Institute, Auburn
Arizona	Mr. C. D. Lebert, P. O. Box 2006, Phoenix
Arkansas	Dr. W. J. Baerg, University of Arkansas, Fayetteville Mr. Dwight Isely, University of Arkansas, Fayetteville
California	Dr. W. B. Herms, University of California, Berkeley Prof. E. O. Essig, University of California, Berkeley Mr. S. Lockwood, Bureau of Plant Quarantine and Control, Department of Agriculture, Sacramento Mr. H. S. Smith, Citrus Experiment Station, Riverside Mr. H. J. Ryan, County Agricultural Building, Los Angeles Mr. D. B. Mackie, Department of Agriculture, Sacramento Mr. M. L. Jones, Department of Agriculture, Sacramento Mr. A. E. Michelbacher, University of California, Berkeley Dr. A. W. Morrill, 815 Hill Street, Los Angeles Mr. L. M. Smith, University of California, Deciduous Fruit Field Station, Route 1, Box 232, San Jose Mr. F. H. Wymore, College of Agriculture, Davis
Colorado	Dr. C. P. Gillette, State Agricultural College, Fort Collins Dr. G. M. List, State Agricultural College, Fort Collins
Connecticut	Dr. W. E. Britton, Agricultural Experiment Station, New Haven Dr. E. P. Felt, Bartlett Research Laboratory, Stamford Dr. P. Garman, Agricultural Experiment Station, New Haven Mr. N. Turner, Agricultural Experiment Station, New Haven Mr. M. P. Zappe, Agricultural Experiment Station, New Haven
Delaware	Dr. L. A. Stearns, Agricultural Experiment Station, Newark

Florida	Dr. Wilmon Newell, Agricultural Experiment Station, Gainesville Mr. J. R. Watson, Agricultural Experiment Station, Gainesville Dr. E. W. Berger, State Plant Board, Gainesville Dr. H. T. Fernald, 707 East Concord Avenue, Orlando
Georgia	Mr. M. S. Yeomans, State Board of Entomology, Atlanta Mr. C. H. Alden, State Board of Entomology, Cornelia Mr. J. B. Gill, Box 572, Albany Mr. Theo. L. Bissell, State Experiment Station, Experiment
Idaho	Dr. Claude Wakeland, University of Idaho, Moscow
Illinois	Mr. W. P. Flint, State Natural History Survey, Urbana Dr. T. H. Frison, State Natural History Survey, Urbana Dr. C. L. Metcalf, State Natural History Survey, Urbana
Indiana	Prof. J. J. Davis, Purdue University, Lafayette
Iowa	Dr. Carl J. Drake, Iowa State College, Ames Mr. H. E. Jaques, Iowa Wesleyan College, Mt. Pleasant
Kansas	Prof. G. A. Dean, State Agricultural College, Manhattan Dr. H. B. Hungerford, University of Kansas, Lawrence Prof. H. R. Bryson, State Agricultural College, Manhattan
Kentucky	Prof. W. A. Price, University of Kentucky, Lexington
Maine	Dr. H. B. Peirson, State of Maine Forest Service, Augusta
Maryland	Dr. E. N. Cory, University of Maryland, College Park
Massachusetts	Mr. A. I. Bourne, Agricultural Experiment Station, Amherst
Michigan	Prof. R. H. Pettit, State College of Agriculture, East Lansing Mr. Ray Hutson, State College of Agriculture, East Lansing
Minnesota	Prof. A. G. Ruggles, University of Minnesota, University Farm, St. Paul
Mississippi	Mr. Clay Lyle, State Plant Board, State College
Missouri	Dr. L. Haseman, University of Missouri, Columbia
Montana	Dr. A. L. Strand, State College, Bozeman
Nebraska	Prof. M. H. Swenk, University of Nebraska, Lincoln Mr. D. B. Whelan, University of Nebraska, Lincoln Mr. L. M. Gates, Department of Agriculture, Lincoln
Nevada	Mr. G. G. Schweis, P. O. Box 1027, Reno



New Hampshire Dr. W. C. O'Hane, Entomologist, College of Agriculture,  
University of New Hampshire, Durham  
Mr. L. C. Glover, Agricultural Experiment Station, Durham

New Jersey Dr. T. J. Hoadlee, University of New Jersey, New Brunswick  
Mr. H. B. Weiss, Chief, Bureau of Statistics and Inspection,  
Department of Agriculture, Trenton

New Mexico Dr. J. R. Eyer, College of Agriculture, State College

New York Prof. C. R. Crosby, Cornell University, Ithaca  
Mr. P. J. Parrott, Agricultural Experiment Station, Geneva  
Dr. R. D. Glasgow, New York State Museum, Albany  
Mr. P. J. Chapman, Box 11, Vassar College, Poughkeepsie  
Mr. R. E. Horsey, Highland Park, Rochester

North Carolina Dr. Z. P. Metcalf, State College, State College Station,  
Raleigh  
Dr. R. W. Leiby, Department of Agriculture, Raleigh

North Dakota Prof. J. A. Munro, North Dakota Agricultural College,  
State College Station, Fargo

Ohio Prof. T. H. Parks, Ohio State University, Columbus  
Mr. J. S. Houser, Agricultural Experiment Station, Wooster  
Dr. H. Osborn, Ohio State University, Columbus  
Mr. E. W. Mendenhall, Ohio State Department of Agriculture,  
97 Brighton Road, Columbus  
Mr. J. N. Knell, Ohio State University, Columbus

Oklahoma Dr. F. A. Fenton, Oklahoma Agricultural and Mechanical  
College, Stillwater  
Mr. C. F. Stiles, Extension Entomologist, Oklahoma  
Agricultural and Mechanical College, Stillwater

Oregon Dr. D. C. Mote, State Agricultural College, Corvallis

Pennsylvania Dr. R. M. Baker, State Department of Agriculture, Harrisburg  
Prof. H. E. Hodgkiss, Pennsylvania State College,  
State College  
Mr. J. R. Stear, c/o Koppers Experiment Farm, Ligonier  
Mr. C. A. Thomas, Pennsylvania State College, Kennett Square  
Mr. H. N. Worthley, Pennsylvania State College, State College

Rhode Island Dr. A. E. Stone, State Department of Agriculture, Providence

South Carolina Prof. Franklin Sherman, Clemson College

South Dakota Prof. H. C. Severin, State College of Agriculture and  
Mechanic Arts, Brookings

Tennessee	Prof. G. M. Bentley, University of Tennessee, Knoxville
Texas	Dr. F. L. Thomas, Agricultural Experiment Station, College Station
Utah	Dr. G. F. Knowlton, Agricultural Experiment Station, Logan Prof. C. J. Sorenson, Agricultural Experiment Station, Logan
Vermont	Dr. H. L. Bailey, State Department of Agriculture, Montpelier
Virginia	Dr. W. J. Schoene, Virginia Agricultural Experiment Station, Blacksburg Dr. H. G. Walker, Virginia Truck Experiment Station, Norfolk Mr. C. R. Willey, Division of Plant Industry, 1112 State Office Building, Richmond
Washington	Mr. M. H. Hatch, University of Washington, Seattle Prof. R. L. Webster, State College of Washington, Pullman Mr. A. J. Hanson, Department of Entomology, Western Washington Experiment Station, Puyallup
West Virginia	Dr. L. M. Peairs, West Virginia University, Morgantown Prof. W. E. Rumsey, Agricultural Experiment Station, Morgantown
Wisconsin	Mr. E. L. Chambers, State Department of Agriculture, Madison Dr. C. L. Fluke, University of Wisconsin, Madison
Wyoming	Mr. C. L. Corkins, Office of State Entomologist, Powell Miss M. Greenwald, Office of State Entomologist, Powell
Puerto Rico	Mr. G. N. Wolcott, Insular Experiment Station, Rio Piedras
Hawaii	Mr. O. H. Swezey, Hawaiian Sugar Planters' Association, Honolulu
Mexico	Dr. Alfonso Dampf, Avenida Insurgentes 171, San Jacinto, Mexico, D. F.
Costa Rica	Dr. C. H. Ballou, Apartado 1368, San Jose
Brazil	Mr. E. J. Hambleton, Instituto Biologico de Defesa Agricola, Sao Paulo
Egypt	Mr. A. H. Rosenfeld, Botanical and Plant Breeding Section, Ministry of Agriculture, El Giza



## THE MORE IMPORTANT RECORDS FOR JANUARY AND FEBRUARY 1936

We wish, at this time, to express our thanks to our collaborators for the excellent cooperation they gave us last year in the collection of Phylloxera adults. We hope to continue this work during the coming year and should appreciate receiving adults from all of our collaborators. We also wish to call your attention to a mimeographed publication (E-360) on the periodical cicada. In this circular we have recorded the localities where Broods X and XXII appeared in previous years. We should appreciate any data on places of appearance this year.

Despite the very severe winter that prevailed over most of the Wheat Belt, reports from Indiana, Arkansas, and Oklahoma indicate that the Hessian fly suffered but little mortality. On the other hand, the chinch bug in Indiana suffered severe mortality, which ran from 49 to 95 percent in parts of the State.

The corn ear worm was prevalent during January in extreme southeastern Texas.

The alfalfa weevil was reported as prevalent in the San Francisco Bay district of California, and by the middle of February parasitization by Bathyplectes was running over 50 percent.

One of the most important sugarcane mites, Tetranychus bancrofti Michael, has been found established on the eastern edge of the Everglades in Florida.

Reports from Virginia indicate that the rosy apple aphid will be more numerous than usual in the southern Appalachian apple-growing districts this year.

Several small infestations of California red scale continue in the Phoenix area of Arizona and an eradication campaign is under way.

The vegetable weevil was numerous enough in the Gulf region and Georgia to attract considerable attention.

The banded cucumber beetle was reported to be attacking a number of truck crops in Florida, Alabama, and California.

Reports from the South Atlantic and Gulf States indicate that the boll weevil has been less active during the late winter than for many years.

During January screw worm population was, in general, very low; however, a minor outbreak occurred in Uvalde County, Tex., where rather serious infestations were found on recently docked sheep.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT

#### HESSIAN FLY (Phytophaga destructor Say)

Indiana. W. B. Noble (January 20): Apparently most of the late fall brood succeeded in completing their growth and forming puparia. Volunteer wheat taken from the field today showed only about 10 percent still in the larval stage. These larvae were from half grown to mature and were apparently still alive. (February 17): Dissection of puparia taken from volunteer wheat in a field near La Fayette on February 8 showed practically no mortality, notwithstanding severe weather. Many of the larvae they contain are now pupating in the greenhouse.

Missouri and Kansas. E. T. Jones (January): A survey early last November indicated that a moderate though potentially important infestation in southeastern Kansas and southwestern Missouri had developed from second-brood hessian flies over an area where infestation by the first brood was comparatively light. The larvae were from half grown to full grown and later developed into second-generation puparia.

Arkansas. Dwight Isely (February 29): For many years hessian fly was not considered a problem in Arkansas because so little wheat was grown. During the past few years, however, the wheat acreage has increased considerably, owing to removal of other crops from the land. Much of this wheat has been sown early for pasture. Practically all of the early sown wheat in Washington County (in northwestern Arkansas) is infested. In some fields 50 percent of the plants are dead and the others are infested.

Oklahoma. F. A. Fenton (February 29): A few observations made last fall indicated a heavier infestation than for many years. The infestations are apparently scattered, but occur in Garfield County in the heart of the wheat belt of the State; however, we do not anticipate serious damage in the State this year.

#### CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (February 18): A mortality of 49 percent, evidently due to the severe winter, was observed in a total of 1,448 chinch bugs present in 25 samples of bunch grasses taken in Tippecanoe County on February 10 and 14. In two samples from exposed situations the mortality was 98 percent.

Oklahoma. F. A. Fenton (February 29): The past winter has been marked by longer periods of cold weather than any winter for some years. General observations indicate that it has had no serious effect on the chinch bug. Records taken by students show an average of 144 chinch bugs per square foot on the college farm at Stillwater, the range being from 20 to 267. These records were taken in the most favorable type of hibernating quarters that we could find, i. e., in a good bunch-grass vicinity



that had been in Sudan grass last summer. It is apparent that there are more chinch bugs in hibernation than there were a year ago.

### CORN

#### CORN EAR WORM (Heliothis obsoleta Fab.)

Texas. T. C. Barber (January): The corn ear worm was frequently found in corn in January in the vicinity of Brownsville, though it was not observed on cotton during the month. The corn was planted late in the fall for the winter crop. Larvae of all sizes are present and pupation is taking place in the insectary.

### ALFALFA

#### ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (February 22): Larvae and adults could be collected throughout the fall and winter in middle lowland California. They were most abundant in the San Francisco Bay area, where by January 17 as high as 28 larvae were collected to 100 sweeps of a net. On the 24th of January the count jumped to 95 and on the 30th to 132. On the 10th of February the count remained about the same, but about one-fourth of the larvae were dead. Whether this was the result of weather conditions or of a fungus has not yet been determined. In the northwestern part of the San Joaquin Valley larvae and adults were collected with ease. On the 24th of January as high as 15 larvae and 15 adults were collected to 100 sweeps of a net. This is the earliest I have taken the weevil in this area. On the 17th of January adults of the parasite Bathyplectes curculionis Thoms. could be collected. Parasitization of the alfalfa weevil larvae, however, was not high. In one field in the San Francisco Bay area 5 larvae out of 26 were found to be parasitized, while in another 6 out of 34 were parasitized. Adult parasites were plentiful, but on the 24th of January only 33 alfalfa weevil larvae out of 308 were parasitized, and on the 30th of January in one field 33 alfalfa weevil larvae out of 213 were parasitized; in another, 13 out of 41 were parasitized; and in a third field 25 larvae out of 63 were parasitized. On the 10th of February 116 larvae out of 192 were parasitized, while in a second field 40 out of 52 were parasitized. Up to the present time some fields have consistently shown higher parasitization than others. In all instances, however, the parasitization increased rapidly as is indicated by the figures given above. The extent of parasitization was obtained from rearing records--that is, large alfalfa weevil larvae were brought into the laboratory and the extent of parasitization was determined on the number of alfalfa weevil cocoons containing cocoons of the parasite. A surprising number of the parasite cocoons are the dark-colored, overwintering form, and I suppose months will elapse before adults will emerge from them. Overwintering cocoons obtained from alfalfa weevil larvae collected during the latter part of May 1935 were placed on a window sill having

a northern exposure. Emergence started about the 10th of January, has continued to be heavy, and is about completed.

CLOVER LEAF WEEVIL (Hypera punctata Fab.)

California. J. C. Hamlin (February 4): Samples of larvae collected by G. G. Schweis near Sacramento were determined by A. G. Boving.

A. E. Michelbacher (February 24): The clover leaf weevil was found generally throughout the alfalfa fields.

ALFALFA LOOPER (Autographa californica Speyer)

California. A. E. Michelbacher (February 24): In checking through alfalfa fields during January and the first part of February, I found the larvae of the alfalfa semilooper quite common. Many of them were parasitized by a tachinid.

SUGARCANE

SUGARCANE BORER (Diatraea saccharalis Fab.)

Louisiana. B. A. Osterberger (February 24): Larvae of the sugarcane borer hibernating in dry corn stalks show an increase in mortality, but among those in the stubble of volunteer corn a few live larvae are found. The mortality from the cold is not so high as it was last season.

SUGARCANE ROOTSTOCK WEEVIL (Anacentrinus subnudus Buchanan)

Louisiana. B. A. Osterberger (February 24): Adults, larvae, and pupae were found in about every variety of sugarcane examined. Injured rootstocks ranged from 30 to 67 percent.

A MITE (Tarsonemus bancrofti Michael)

Florida. F. M. Annand (January 28): Word has recently been received of the discovery of T. bancrofti on sorghum hybrids and New Guinea canes in four locations on the experimental plats maintained by the United States Department of Agriculture at Canal Point, on the eastern edge of the Everglades. An infestation was also found in an adjoining field of commercial cane. Owing to the rather general occurrence of the mite, it is feared that its eradication may prove to be difficult.



## FRUIT INSECTS

### APPLE

#### CODLING MOTH (Carpocapsa pomonella L.)

Georgia. C. H. Alden (February 19): The winter carry-over of hibernating larvae of the codling moth is moderate at Cornelia. Practically none have been killed by winter temperatures but some are dead from fungus.

Oregon. D. C. Mote (February 25): B. G. Thompson reports that at the last examination the larvae were coming through in good condition.

#### ROSY APPLE APHID (Anuraphis roseus Baker)

Virginia. W. J. Schoene (February 28): Last fall returning migrants of the rosy aphid were found in numbers on apple foliage in many sections of the State, and during the winter aphid eggs have been observed to be more numerous than usual. Accordingly, growers are showing considerable interest in the aphid spray. We expect this to be a rosy-aphid year.

#### SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (January 24): The San Jose scale is more abundant than usual on peach trees at Fort Valley. The percentage of living scale on unsprayed peach trees in January was lower than that of an average year, which may be due to the unusually cold winter. Of 30,600 scale counted under the binocular during the period January 14 to 24, 23,168, or 75.7 percent, were found to be alive.

C. H. Alden (February 19): Scale was very bad on peach and apple at Cornelia in the fall, but spraying and extremely severe winter weather have greatly reduced the numbers and have prevented breeding.

Alabama. J. M. Robinson (February 25): San Jose scale is moderately abundant on fruit trees at Auburn, Grand Bay, and some other places in the State.

### PEACH

#### PLUM CURCULIO (Conotrachelus nemophilus Hbst.)

Georgia. C. H. Alden (February 19): Plum curculio still in hibernation at Cornelia.

#### PEACH BORER (Aegeria exitiosa Say)

Alabama. J. M. Robinson (February): The peach tree borer was moderately abundant at Auburn, requiring treatment.

GREEN PEACH APHID (Myzus persicae Sulz.)

California. E. O. Essig (February 26): Because of the mild winter, aphids have survived in considerable numbers in the San Francisco Bay area. The green peach aphid has been abundant at Berkeley. Adults of the black peach aphid (Aphis persicae-niger Smith) have been noted on peach trees that have held their leaves all winter.

RASPBERRY

RASPBERRY CANE BORER (Oberea bimaculata Oliv.)

Utah. G. F. Knowlton (January 10): The following letter was recently received: "While pruning raspberries I noticed some of the new canes fell over. On examination, I found in various canes, but principally in the weaker ones, larvae ranging from about 3/16 to 1/2 inch long. The smaller ones were white, whereas the larger ones were dull white with dark heads. The larvae entered and worked in the canes from 1 to 8 inches above the ground."

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

California. S. Lockwood (February 25): The grape leafhopper was overwintering in considerable numbers in sections of the San Joaquin Valley. Reports state that the excessive rainfall of the last 2 weeks has apparently reduced the numbers markedly.

PECAN

OBSURE SCALE (Chrysomphalus obscurus Comst.)

California. M. L. Jones (February 25): The foci of known infestations in California are limited to Pacoima, Los Angeles County, and the vicinity of Flinn Springs, San Diego County. The infestation is found only on pecan trees.

WALNUT

FROSTED SCALE (Lecanium prunosum Coq.)

California. H. J. Ryan (February 21): Infestations on English walnut trees in the Pomona district became so severe during the winter that about 250 acres of walnut orchards were sprayed with oil in January. This scale has been well established for many years in southern California, but this is the first record of any build-up to population requiring treatment.



## CITRUS

### FRUIT FLIES (Anastrepha spp.)

Texas. P. A. Hoidale (January): All species of fruit flies found in the Rio Grande Valley previously were trapped in increased numbers there during January. The total for this month over December for Anastrepha ludens Loew jumped from 8 to 49; A. serpentina Wied., from 43 to 76; A. fraterculus auct., from 9 to 15; A. sp. "Y", from 7 to 30; A. pallens Coq., from 489 to 530; and Toxotrypana curvicauda Gerst., from 11 to 26. Two specimens which have been listed as probably new species were also trapped. No larval infestations were found throughout the month.

### MEALYBUGS (Pseudococcus spp.)

California. H. J. Ryan (February 21): Occasional infestations of P. maritimus Ehrh., and P. citri Risso still require liberations of the ladybeetle Cryptolaeus montrouzieri Muls. Control of P. bahani Green has been maintained by the parasites Coccinellus gurneyi Compere and Tetraneura pretiosus Timb.

### A SCALE INSECT (Lepidosaphes halli Green)

California. M. L. Jones (February 25): Surveys are in progress to establish the possible distribution of Hall's scale in the Chico district of Butte County. To date, all evidence indicates that it has not spread from the United States Plant Introduction Garden. Eradication of this scale during one season was attempted in the spring of 1935. The only survivors found to date were four individuals on one tree. The group containing this tree is isolated and has been given a very drastic treatment. All stone-fruit trees leaving the station, about 3,600 in number, have been treated by vacuum fumigation.

### CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (February 24): Approximately 10,000 citrus trees are being fumigated in the Phoenix area. It is hoped that complete eradication of this pest will be achieved.

### GREEN CITRUS APHID (Arhis spiraeicola Patch)

Florida. J. R. Watson (February 24): The first part of the winter was very dry. Since then it has been cold and wet. These conditions were very unfavorable for the development of the citrus aphid, as there was no food in the early part of the winter and it has been too cold for rapid development since. Aphids are at present about as scarce as I have ever seen them.

A FLOWER THRIPS (Frankliniella tritici californicus Moul.)

Arizona. C. D. Lebert (February 24): Thrips were observed in great numbers on citrus at Castle Hot Springs on January 9. Little foliage injury was found but the citrus fruits, upon which the thrips had congregated by the thousands, showed pronounced speckling and softening of the rinds. The thrips were also observed on nearby truck crops. This thrips has also been observed on citrus in the Phoenix district but not in abundance.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (February 24): Because of weather conditions, citrus rust mites have given very little trouble this winter.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Gyll.)

Georgia. T. L. Bissell (January 29): On November 25, 26, and 27, 1935, a survey was made in several middle-Georgia towns for the vegetable weevil. Larvae were found on turnip at Griffin, Orchard Hill, Milner, and Barnesville, but none at Experiment. Larvae were collected at 14 of 24 properties visited. No serious injury was observed. On December 12 larvae were sent to me from Clarkston, De Kalb County, on Chinese cabbage. (February 20): Vegetable weevil larvae, apparently of the second and third instars, were found in turnip crowns today near Milner.

Alabama. J. M. Robinson (February 25): The vegetable weevil has developed slowly through the winter months and some individuals are pupating.

Mississippi. C. Lyle (February 24): The vegetable weevil has been responsible for most of the insect complaints received. Reports have been received from 14 properties in the vicinity of Booneville, Kosciusko, Vicksburg, Lexington, Carthage, and Ethel.

Louisiana. B. A. Osterberger (February 29): Today larvae of the vegetable weevil were received from Iota, Acadia Parish, where they were attacking turnips.

California. S. Lockwood (February 25): The vegetable weevil was found in home gardens and small commercial plantings of vegetables in the city of Santa Barbara County, and close environs. The annual survey made December 1935 in the Santa Maria and Lompoc Valleys gave negative results.



BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Florida. J. R. Watson (February 24): Several complaints of the belted cucumber beetle on truck crops have been received. One grower in Highlands County reported the complete destruction of 20 acres of lima beans.

Alabama. J. M. Robinson (February 25): The banded bean beetles were very active on fall greens up to November 18.

California. R. E. Campbell (January 7): In several pea fields in Orange County the belted cucumber beetle was numerous, though doing little feeding.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

Virginia. H. G. Walker (February 28): Twelve-spotted cucumber beetles were active and feeding on plantain on February 26 at Norfolk.

Georgia. T. L. Bissell (February 17): Beetles were found hibernating under dead leaves and grass at Experiment between January 14 and February 17.

CUTWORMS (Noctuidae)

Georgia. T. L. Bissell (February 12): Armyworms are rather plentiful, hibernating in dead grass and leaves at Experiment. Between January 17 and February 12, 26 larvae were taken from 22 plots, each 1 yard square.

Tennessee. G. M. Bentley (February 28): I have seen a number of different species of noctuids in flight but do not know the species. These moths were medium-sized and smaller individuals.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Florida. F. S. Chamberlin (January): The southern green plant bug was unusually abundant during the fall and is now found in semihibernation in sheltered places.

Texas. F. L. Thomas (February 26): The southern green plant bug was observed near Crystal City recently.

FALSE CHINCH BUG (Nysius ericae Schill.)

Arizona. C. D. Lebert (February 24): Adult false chinch bugs were first noticed in considerable numbers on weed cover crops in several of the citrus groves in the north Phoenix area.

GARDEN CENTIPEDE (Scutigera immaculata Newp.)

California. S. Lockwood (February 25): The lowlands of the Sacramento Valley have been inundated for several days. It is believed that if the water is not pumped out too soon, the asparagus fields will be rid, to a degree at least, of the garden centipede.

A. E. Michelbacher (February 24): In checking over some infested fields in the delta area of the Sacramento and San Joaquin Rivers, I found a marked reduction of the pest in several places.

TOMATO

A CHIRONOMID (Spaniotoma sp.)

Ohio. J. N. Knull (January 15): Numerous tomato plants in a greenhouse at Lancaster were infested with chironomid larvae, probably of the genus Spaniotoma. The larvae entered the stems just above the ground level and worked up into the living tissue. The injury caused the young plants to break and wither.

ONION THRIPS (Thrips tabaci Lind.)

Virginia. H. G. Walker (February 28): The onion thrips was found to be seriously injuring young tomato and celery plants in a greenhouse at Norfolk. Apparently the thrips had been breeding on cucumber vines and when the old vines were removed and replaced with young tomato and celery plants, large numbers of the thrips transferred their attention to them and caused serious injury before their presence was detected and control measures were applied.

Texas. F. L. Thomas (February 26): Onion thrips are beginning to increase in numbers in the Winter Garden district. The infestation is much lighter than in 1935 at this time, averaging less than 5 per onion plant on February 24.

BEANS

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. H. G. Walker (February 28): Large numbers of bean leaf beetles were found hibernating under trash in an old bean field at Norfolk on February 27.

Georgia. T. L. Bissell (February 17): Beetles were found hibernating beneath dead leaves and grass at Experiment between January 14 and February 17.



PEAS

PEA APHID (Illinoia pisi Kalt.)

- California. A. D. Michelbacher (February 24): The pea aphid is quite common on alfalfa.
- Georgia. T. L. Bissell (February 20): The pea aphid is scarce on Austrian peas at Experiment. This insect usually becomes abundant the first or middle of May.
- California. R. E. Campbell (January 7): In several pea fields in Orange County the pea aphid has gradually been increasing, until by the first of the year it was numerous enough to cause injury.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

- Florida. F. S. Chamberlin (January): The cabbage worm is moderately abundant on collards and cabbage.
- Mississippi. C. Lyle (February 24): The imported cabbage worm was observed on turnips at State College during November and December, but was less abundant than the cabbage looper.
- Louisiana. B. A. Osterberger (February 24): During the entire winter, adults of the cabbage butterfly have been noticed in flight on warm days. Eggs and young stages could be found at any time during the warmer part of the winter.

CABBAGE LOOPER ( Autographa brassicae Riley)

- Florida. J. R. Watson (February 24): The cabbage looper has been less troublesome than usual, owing to the cold rainy weather.
- Mississippi. C. Lyle (February 24): The cabbage looper was fairly abundant on turnips at State College in November and December.
- Texas. F. L. Thomas (February 26): The cabbage loopers are practically absent from the lower Rio Grande Valley and from the Winter Garden district.

DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

- Florida. J. R. Watson (February 24): The diamond-back moth has been less troublesome than usual, owing to the cold rainy weather.
- Texas. F. L. Thomas (February 26): The diamond-back cabbage worm is practically absent from the lower Rio Grande Valley and from the Winter Garden region.

CABBAGE APHID (Brevicoryne brassicae L.)

Georgia. T. L. Bissell (February 20): Collards at Experiment are lightly infested with aphids.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Georgia. T. L. Bissell (February 17): M. histrionica was found hibernating under dead leaves and grass at Experiment between January 14 and February 17.

Mississippi. D. W. Grimes (February 24): This pest was observed on turnips at Kosciusko on February 13.

Texas. F. L. Thomas (February 26): The harlequin bug is abundant on old plantings of turnips in the Winter Garden district.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Georgia. T. L. Bissell (February): The turnip aphid did considerable damage to greens at Experiment in November.

Louisiana. B. A. Osterberger (February 24): The turnip aphid is moderately abundant on turnips. The convergent ladybeetle (Hippodamia convergens Guer.) is present.

Texas. F. L. Thomas (February 26): The turnip aphid is abundant on old plantings of turnips in the Winter Garden district.

CELERY

SOUTHERN ARMYWORM (Prodenia eridania Cram.)

Florida. J. R. Watson (February 24): A heavy infestation of the semi-tropical armyworm occurred on celery in the Sarasota and Sanford districts. The insect worked like a cutworm, gouging out and ruining the stalks at the base. The infestation has largely subsided, although a few individuals are still present.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius Fab.)

Florida. F. S. Chamberlin (January): During the year 1934 an outbreak of the sweetpotato weevil occurred in the northern part of Gadsden County. Eradication methods were employed for a short time. Reports now indicate that the insect is becoming well established within a small area, and one field of potatoes has been reported as a total loss because of it. This pest represents a potential menace in this section, where sweetpotatoes are among the important crops.



HOPS

HOP APHID (Phorodon humuli Schr.)

Oregon. D. C. Mote (February 25): N. Larson reports live hop aphids present after the freeze, which occurred on October 30 and continued into the first few days of November with a minimum temperature at Corvallis of 18° F.

STRAWBERRY

STRAWBERRY ROOT APHID (Aphis forbesi Weed)

Virginia. H. G. Walker (February 26): Eggs of the strawberry root louse, which are not nearly so abundant at Norfolk this year as last, were beginning to hatch on February 27.

COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker (February 26): Red spiders are rather abundant in many strawberry fields on the Eastern Shore of Virginia and in the Norfolk trucking area.

Oregon. D. C. Mote (February 25): I observed the common red spider mite alive after the freeze of October 30.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (February 24): The pepper weevil, which was found in Manatee County last year, has not been seen since August. Complete destruction of all the pepper fields during the summer is undoubtedly responsible for this scarcity and possible elimination.

C O T T O N   I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy (January): No activity during January in the weevil hibernation cages at Florence, the first time in years that no weevils were seen in the cages in this month.

Alabama. J. M. Robinson (February 25): Boll weevils were moderately abundant in the fields. They were forced to go into hibernation without food after the middle of November.

Louisiana. R. C. Gaines (January): A few weevils were active in the hibernation cages at Tallulah until January 17, but there was no activity after that date. No weevils were taken on the flight screens at Tallulah during the month. This is the first time during the 5 years the screens have been in operation that no weevils were caught in January.

Texas. R. W. Moreland (January): Active weevils were observed in most of the hibernation cages at College Station on the warm days in January, the largest number being seen on January 17, when the maximum temperature was 79° F.

K. P. Ewing and R. L. McGarr (January): At Port Lavaca weevils were breeding in fields of green cotton until the freezes on January 19 and 20. After that only one adult weevil was observed in the field.

T. C. Barber (January): Boll weevil larvae and adults abundant at Brownsville.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

GROUND MEALYBUG (Rhizoecus terrestris News.)

California. E. O. Essig (February 26): The ground mealybug has been taken on the roots of lawn grasses and many kinds of annual and perennial ornamental plants in the San Francisco Bay area during the fall and winter. It does considerable damage to some plants and is difficult to control.

BLACK SCALE (Saissetia oleae Bern.)

Mississippi. C. Lyle (February 24): Specimens of this scale on poinsettias were received from Sanatorium on January 8.

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Alabama. J. M. Robinson (February 25): Euonymus scale was generally active on ornamental japonicas, particularly at Prattsville, Canoe, and Montgomery during December.

DEODAR WEEVIL (Pissodes deodarae Hork.)

Alabama. J. M. Robinson (February 25): This beetle was attacking ornamental cedars at Uriah during October.

AN APHID (Forda olivacea Rohw.)

California. E. O. Essig (February 26): This aphid has been abundant on the roots of Bromus carinatus in the vicinity of Berkeley this winter, but only apterous viviparous females are in evidence.



COMMON RED SPIDER (Tetranychus telarius L.)

Louisiana. B. A. Osterberger (February 24): The red spider is moderately abundant on azalea plants and evergreen shrubs.

Mississippi. C. Lyle (February 24): An infestation of red spiders on cedar was reported from Meridian on February 13.

AUCUBA

AN APHID (Macrosiphum aucubae Bartholomew)

California. E. O. Essig (February 26): Because of the mild winter, aphids have survived in considerable numbers in the San Francisco Bay area. The aucuba aphid has been abundant at Berkeley.

FERN

FERN SCALE (Hemichionaspis aspidistrae Sign.)

Alabama. J. M. Robinson (February 25): The fern scale was reported damaging the fronds of ferns at Foley early in January.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Florida. J. R. Watson (February 24): Gladiolus thrips have been active all winter but infestations are not heavy.

RHODODENDRON

RHODODENDRON WHITEFLY (Dialeurodes chittendeni Laing)

Tennessee. G. M. Bentley (February 28): In the latter part of December we made a trip to Johnson City, Washington County, and looked over sections of Carter County, examining rhododendrons. We found a light infestation of D. chittendeni passing the winter on the underside of rhododendron leaves.

SPIREA

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (February 24): An infestation of cottony-cushion scale on spirea was reported from Columbia on January 4. Ladybird beetles were promptly colonized on the property.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

ANTS (Formicidae)

District of Columbia. R. A. St. George (February 27): Several species of household and lawn ants have been swarming in the basements of buildings in Washington. Specimens of Lasius sp. were received during the week of February 24 among forms mistaken for termites.

Virginia. C. R. Willey (February 27): A species of ant has been swarming in houses in and around Richmond for the past several weeks.

Mississippi. C. Lyle (February 24): Numerous complaints of Solenopsis xyloni McCook were received during the winter. A report from Vicksburg on February 14 stated that the ants had ruined articles of clothing, especially woolen blankets.

ARGENTINE ANT (Iridomyrmex humilis Mayr)

Alabama. J. M. Robinson (February 25): The Argentine ant continues to be a pest at many points over the State.

Mississippi. C. Lyle (February 24): Numerous complaints of the Argentine ant were received during the winter from towns where control campaigns were not conducted last year. About February 1 a correspondent in Hattiesburg reported that they were "making life almost unbearable."

Missouri. J. C. Dawson (December 11): Ants determined as the Argentine ant were collected on December 11, 1935, at University City, Saint Louis County.

Texas. R. Melvin (February): One infestation of the Argentine ant reported at Dallas.

HOUSE CRICKET (Gryllus domesticus L.)

Alabama. J. M. Robinson (February 25): Crickets have been reported doing damage to household furnishings at Dothan during February.

BOXELDER BUG (Leptocoris trivittatus Say)

Utah. G. F. Knowlton (February 24): Large numbers of boxelder bugs are emerging from hibernation and are sunning themselves upon south walls of buildings on warm afternoons at Salt Lake and Logan. This pest has caused some annoyance indoors during the past few weeks.



California. R. E. Campbell (January 23): After several warm, dry days, adults are active and flying about at Alhambra.

TROPICAL RAT MITE (Libonyssus bacoti Hirst.)

California. D. B. Mackie (February 25): This blood-sucking mite was submitted to the Entomological Service of the Department of Agriculture in Sacramento on January 16 with the information that it is causing considerable trouble in an apartment house. Typical dermatitis was present on two members of the custodian's family. Considerable trouble also is experienced from rats. This is a second record for Sacramento. The previous one was made in 1934. The only other State record is one from San Diego in 1930.

CATTLE

SCREW WORMS (Cochliomyia spp.)

Florida. F. C. Bishopp (February 27): The number of screw worm infestations in Florida from Dixie, Gilchrist, Alachua, Putnam, and Flagler Counties southward, was decidedly lower during the week ending February 15 than for any other weekly period of the winter.

F. S. Chamberlin (January): The screw worm is apparently causing no injury to livestock in Gadsden County.

Alabama. J. M. Robinson (February 25): The screw worm was rather scarce over the State until October, when it appeared in a few scattered counties in rather large numbers. It was found as far north as Florence, Lauderdale County.

Texas. A. W. Lindquist (January): A minor outbreak of C. americana C. and P. occurred in Uvalde County in January. The cause of most of the trouble was docking sheep, although other types of wounds also became infested. The weather apparently was ideal for screw worm attack, being characterized by hot days above average and cool nights below average. Most of the ranchmen reported more or less screw worm trouble. One man had 26 cases in 100 docked sheep. Five collections from these showed C. americana, and probably all cases were of this species. A ranchman near Rio Frio reported that of 41 docked sheep, 25 were lost because of screw worm attack. Some of the cases observed were very bad, harboring from 1,000 to 2,000 C. americana larvae and many eggs. At Sonora and Menard, about 150 miles north of Uvalde County and at a considerably higher elevation, no screw worm cases were observed in January.

. HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Virginia. C. R. Willey (February 27): Termites have been swarming in houses in and around Richmond for the past several weeks.

District of Columbia. R. A. St. George (February 27): During the week of February 24 many requests have been received for information concerning the control of the subterranean termite, R. flavipes Kol., adults of which have been swarming in numbers in households in Washington, D. C., and vicinity.

Michigan. E. I. McDaniel (March 4): We have received our first report of emergence of termites for the year. It came from Muskegon with a statement that a basement was filled with the wings of termites on March 1 and that this is the second season they have made their appearance.

Georgia. T. L. Bissell (February 21): Termites have just begun to be noticed in dwellings. On February 19 I had a call from Griffin, and today I received an inquiry from Columbus.

Alabama. J. M. Robinson (February 25): Termites continue to worry property owners all over the State. They were reported swarming as late as November 5 in Mobile County.

Mississippi. C. Lyle (February 24): Numerous complaints of injury by R. flavipes were received during the winter.

Louisiana. B. A. Osterberger (February 24): A few termites have been noticed in flight from a steam-heated building in Baton Rouge.

Oklahoma and Texas. J. A. Beal (January): R. tibialis Bks. has done a great deal of damage during the past summer to nurseries in Oklahoma and Texas. This damage was peculiar in that it was not associated with buried wood or seedbed frames, but occurred on the roots of seedling hardwood trees, in cultivated rows, often where the soil appeared to be almost free from rotting vegetation. Injury has been most severe to green ash, mulberry, hackberry, and honeylocust seedlings, although almost no species showed immunity. In some nurseries it is estimated that losses during the growing season ran as high as 25 percent.

Utah. G. F. Knowlton (February 17): Termites were found infesting timbers in a basement in Salt Lake City.



A DERMESTID (Trogoderma sp.)

Kansas. R. T. Cotton (January): Although dermestid beetles have been generally considered to be chiefly feeders on animal products, it has been found that Trogoderma sp., probably T. versicolor Creutz., is one of the worst pests of stored seeds at Manhattan. This species was also found in a local tire-repair shop, where it was breeding in large numbers in the compound used for vulcanizing tires.

PEA WEEVIL (Bruchus pisorum L.)

Oregon. D. C. Mote (February 25): B. G. Thompson reports that on January 27 he found considerable numbers of pea weevils in hibernating quarters near Athena, in Umatilla County. Of those collected and brought into the laboratory, 94.9 percent were alive.

A POWDER-POST BEETLE (Lyctus planicollis Lec.)

Alabama. J. M. Robinson (February 25): In December the powder-post beetle was destroying hickory furniture in Birmingham.

Mississippi. C. Lyle (February 24): Specimens of this insect were taken from a hardwood floor in Yazoo City on January 3. The floor had been put down only a few months before.

NOTES FROM EGYPT, DECEMBER 23, 1935,

by

A. H. Rosenfeld

A recent survey has revealed that Pyrausta nubilalis Hbn. is generally distributed over Lower Egypt, extending as far south as Giza Province (near Cairo). Investigations lead to the conclusion that four generations occur annually in Egypt. Examination of individual infested cornstalks at Damietta and Alexandria revealed from 10 to 12 live larvae per stalk. In a number of cases Sesamia sp. and Chilo sp. were found feeding in the same internode with the corn borer and at times their galleries were joined. In Alexandria complete infestations may be found and 30-percent infestation is common.

The degree of infestation by Polychrosis botrana Schiff. in the vineyards around Amria (Lower Egypt) last season averaged about 12 percent, whereas the maximum damage reached 30 percent.

In a recent survey the long-winged form of mole cricket (Gryllotalpa gryllotalpa L.) was noted everywhere in small numbers, but the short-winged form (G. gryllotalpa cophta Haan) seems to be by far the most common and widely distributed type, especially in Lower Egypt (Alexandria, Port Said, Suez, and Ismailia). G. africana Bdv. was seen more particularly in the Fayum (Middle Egypt) and in some parts of Lower Egypt, such as Dessuk, Fareskur, and Mit Gamr.

NOTES FROM PUERTO RICO

F. M. Vandenberg, of the Mayaguez, P. R., laboratory, reports that in the investigations of the insects affecting corn recently undertaken in Puerto Rico, the work of a dipterous maggot was observed in ears of green corn. This maggot has been identified as the young of a fly, Euxesta stigmatias Loew. A closely allied species in this country is well known as a scavenger. The Puerto Rican species, however, has been reared on fresh green corn from egg to adult.

H. K. Plank sent in specimens of Cryptotermes cavifrons Bks. and C. brevis Walk., which were taken on January 20 as they were flying around lamps in a house at Mayaguez, P. R. (Det. by T. E. Snyder.)



CHINCH BUG ABUNDANCE IN WINTER QUARTERS  
NOVEMBER-DECEMBER 1935

C. M. Packard, Senior Entomologist,  
Bureau of Entomology and Plant Quarantine,  
United States Department of Agriculture

The accompanying map is based on early winter surveys of the area infested by chinch bugs in 1935 and adjacent areas, conducted by the State entomologists of Michigan, Ohio, Indiana, Illinois, Wisconsin, Minnesota, Iowa, Missouri, Nebraska, Kansas, and Oklahoma, either in cooperation with the Bureau of Entomology and Plant Quarantine or entirely on State funds. These surveys were supplemented by reports from State and Federal entomologists. Most of the surveys were based on hibernating bugs. Some of the information, however, was based on the infestation in standing corn late in the season. In view of the varied conditions and types of cover in different regions and unavoidable differences in survey methods the degrees of severity indicated on the map are only approximate.

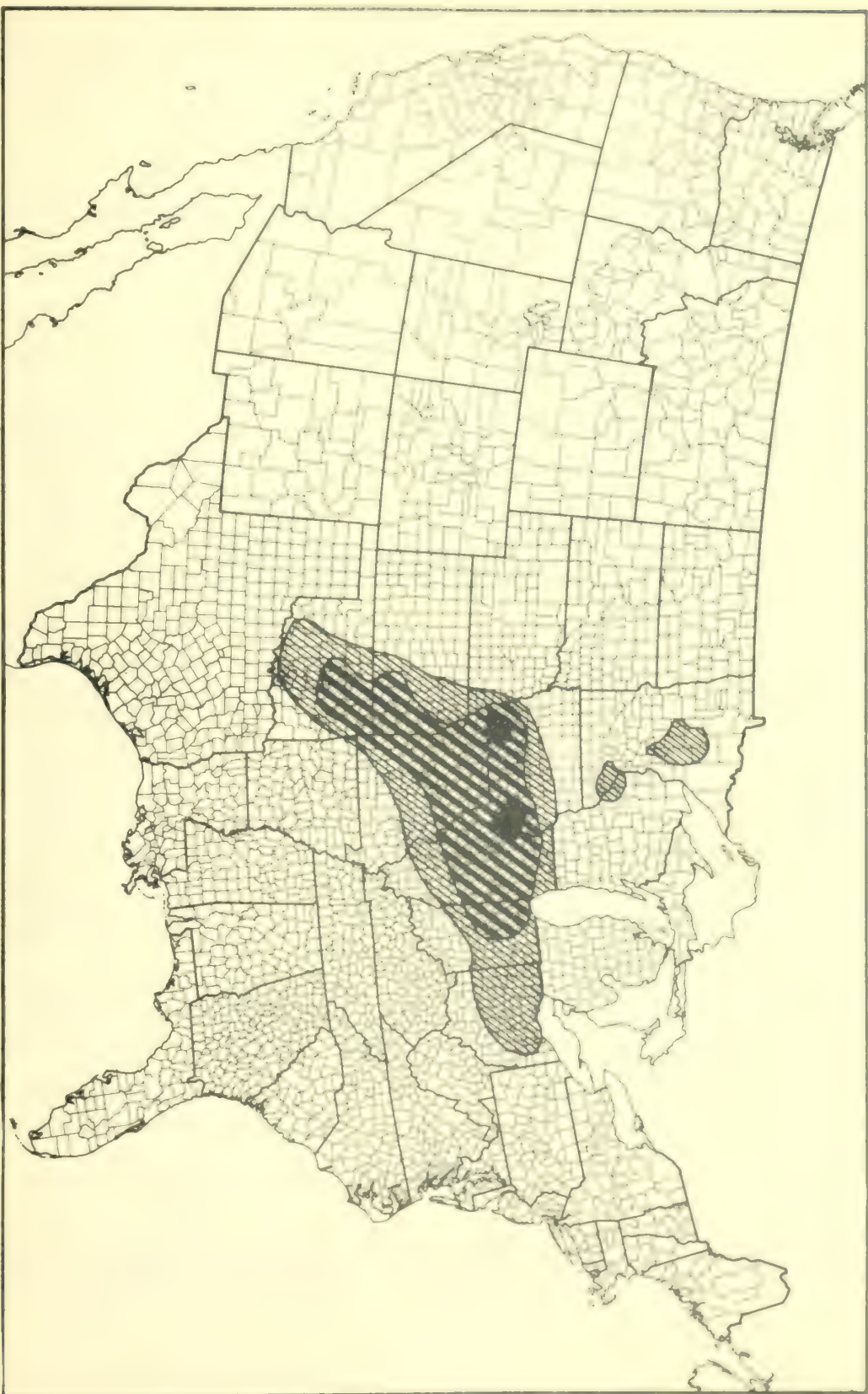
Hibernating populations in general are considerably lighter than they were a year ago and the area in which chinch bugs are present in dangerous numbers is considerably less. Fragmentary reports from Iowa, Illinois, and Indiana also indicate a winter mortality of about 50 percent over a rather extended area. The prospect of severe and widespread injury in 1936 is, therefore, decidedly less threatening than in 1935. At the same time, the bugs are still so numerous that spotted injurious infestations in several States, with rather severe and general infestation in the heart of the Corn Belt, may occur if spring and early summer weather conditions are favorable to chinch bug activity.





# CHINCH BUG ABUNDANCE IN HIBERNATION QUARTERS

Based on surveys made in November and December 1935  
by the Bureau of Entomology and Plant Quarantine in cooperation with the infested States



Scant to moderate. Injury likely only if 1936 season is favorable.



Abundant. Some injury likely if 1936 season is average.



Vol. 16

April 1, 1938

No. 2

## THE MORE IMPORTANT ENTOMOLOGICAL RECORDS IN THE UNITED STATES FOR

MARCH 1938

Heavy infestations by cutworms were reported from Colorado and Arizona.

Throughout the northern part of the chinch bug belt this insect suffered winter mortality as high as 50 percent in parts of Iowa, Illinois, and Indiana. In the States farther south mortality was considerably lower; however, there are sufficient bugs over most of the infested territory to cause serious damage if favorable spring weather prevails.

Green bug appeared during the third week in March in Comanche County, Okla.

Heavy infestations of hessian fly are reported from central Missouri southward. Similar infestations are reported from southeastern Kansas and parts of Oklahoma.

Corn ear worm was active throughout the winter in the Brownsville, Tex., district and by the middle of March was appearing in numbers in that region. By the third week in the month egg laying was observed in the upper coastal section of the State.

Eggs of the European red mite are unusually numerous in the New England, Middle Atlantic, and East Central States.

Green apple aphid is reported as generally abundant in the New England and Middle Atlantic States. Heavy infestations of rose apple aphid are forecast from Virginia and West Virginia, as eggs are very numerous.

High mortality of San Jose scale is reported in the East Central States, where very severe subzero weather occurred the past winter.

High mortality of codling moth occurred in the East Central States.

Although weather conditions have been favorable for the emergence from hibernation of the plum curculio in the peach section of Georgia, practically none were observed in the orchards in the vicinity of Fort Valley up to the



time of petal fall the third week in March.

The vegetable weevil was found this spring in Texas 500 miles west of any known previous infestation and also at Jacksonville, Fla., which is east of the known infested area in that State.

High winter mortality of the Mexican bean beetle was reported from Delaware and Ohio.

Heavy infestation of the cabbage aphid was recorded from Mississippi, with light infestations northward through Georgia to southern Virginia.

From Louisiana to South Carolina boll weevils were still in hibernation at the end of March and present indications point to a low survival in this region. In Texas, however, they were active during the entire month.

Heavy emergence of cotton flea hopper is reported from Texas.

Pink bollworm emergence began the third week in February in the State of Durango, Mexico. This insect has thus far carried over in rather large numbers in the soil in the vicinity of Presidio, Tex. All cotton fields examined in Puerto Rico were found to be lightly infested with this pest.

Fall cankerworm was generally prevalent throughout New England and the Middle Atlantic States, and spring cankerworm was active during the latter half of the month from Iowa and Missouri southward to Kansas and Oklahoma.

Observations made this spring indicate that the screw worm fly was not able to pass the winter north of the southern two-thirds of Florida and the southern third of Texas.

## GENERAL FEEDERS

### WHITE GRUBS (Phyllophaga spp.)

Louisiana. B. A. Osterberger (March 31): The first June bug flight at Baton Rouge of this season was on the night of March 8. It consisted of P. calceata Lec. and P. congrua Lec. Only a few have been noticed in flight since that time.

Kansas. H. R. Bryson (March 23): Excavations reveal the fact that white grubs are not so abundant at Manhattan as might be expected following the beetle year. A number of dead grubs have been found within the first 6 inches of soil and appear to have been killed by low temperatures.

Texas. F. L. Thomas (March 23): P. calceata is active at present; on March 23, 327 were collected at light. P. crassissima Blanch., P. hirtiventris Horn, P. praetermissa Horn, P. rubiginosa Lec., and P. profunda Blanch. are also active.

### JAPANESE BEETLE (Popillia japonica Newm.)

Pennsylvania. R. M. Baker (March 24): We are planning to do some soil-treatment work in the city of Erie again this year with the cooperation of the Federal Government, starting April 15. In this area we are trapping fewer beetles each year but these few are spreading over a gradually widening territory within the city limits.

### CUTWORMS (Noctuidae)

Colorado. G. M. List (March 17): During the last few days the army cutworm (Chorizagrotis auxiliaris Grote) has been reported as damaging wheat in Boulder, Weld, and Larimer Counties.

Arizona. C. D. Lebert (March 24): Several species of cutworms are giving trouble to lettuce and melon growers. Some damage has occurred also on residential flower beds. The predominant species is Agrotis ypsilon Rott.

### MONARCH BUTTERFLY (Danaus plexippus Hbn.)

Florida. H. T. Fernald (March 21): The monarchs have entirely disappeared at Orlando. They have probably laid their eggs and died and there should be newly grown larvae or pupae now, as the fresh adults normally appear about April 1.

## COMMON RED SPIDER (Tetranychus telarius L.)

Mississippi. C. Lyle and assistants (March 25): Heavy infestation of red spider on lilies in a greenhouse at Moss Point was observed on March 17. The pest is fairly abundant on arborvitae in Lincoln and Pike Counties and is present on Camellia japonica at Poplarville and Picayune. A rather heavy infestation was noticed in a satsuma orchard in Harrison County on March 14.

Louisiana. B. A. Osterberger (March 21): The common red spider is numerous on azalea and arborvitae.

Missouri. L. Haseman (March 24): The red spider was a very serious pest in a number of central- and northwestern-Missouri orchards and a few southwestern-Missouri orchards during the dry July of 1933. Unbelievable numbers went into resting or hibernating conditions in the soil, in the litter, and under the bark scales on the trees in these orchards, but before winter set in, practically all in the soil were dead and in midwinter most of those in leaf coverage and in the crotches of trees were also dead. Considerable numbers, however, survived under the bark scales and freezing experiments conducted recently indicate that the low temperature of the winter did not seriously harm those that escaped the effects of moisture.

## CEREAL AND FORAGE-CROP INSECTS

### WHEAT

#### CHINCH BUG (Blissus leucoconterus Say)

General. F. N. Amund (March 11): Preliminary reports on mortality of chinch bugs in the seriously infested area of the Corn Belt States indicate that average mortalities as high as 50 percent occur in certain counties in Iowa, Illinois, and Indiana. Mortality is considerably lower in Missouri, Kansas, and Oklahoma. Even with the mortality indicated at present, there are sufficient bugs to cause serious damage should spring weather be favorable.

Indiana. C. Benton (March 20): The finding of forty additional samples of bunch grasses in Elkhart County on February 27 and March 16 substantiates last month's report of about 50 percent mortality of hibernating chinch bugs.

Illinois. W. F. Flint (March 20): Recent general surveys of the chinch bug infested area have shown that the bugs came through the winter with mortality of approximately 20 to 25 percent. Our examinations to date indicate that there are about 80 percent as many bugs now in hibernation as there were in the spring of 1934. There are enough bugs to cause serious damage should the weather of the late spring be dry.

Correction.--Chinch bug mortality in Indiana as reported in the Insect Pest Survey Bulletin dated March 1, 1936, p.5, should read "from 19 to 98 percent."



Iowa. H. E. Jaques (March 25): Chinch bugs are coming out of hibernation in large numbers in southeastern Iowa.

Missouri. L. Haseman (March 24): Notwithstanding the severe cold, the chinch bugs have wintered with only 10 to 20 percent mortality in the highest mortality counts. Some of our counts in the recent survey show from 500 to 1,000 bugs per bunch grass clump approximately 6 inches in diameter, but generally the numbers of bugs are fewer than they were a year ago. Over most of the corn-growing section of the State there are enough hibernating bugs to cause serious damage should we have a dry spring and summer.

Kansas. H. A. Bryson (March 25): No flight of chinch bugs has been observed. Counts reveal the fact that the winter survival was high. The number in hibernation showed moderate abundance.

GREEN BUG (Toxotera graminum Lond.)

Kansas. H. A. Bryson (March 26): No green bugs found by E. G. Kelly in southern Kansas.

Oklahoma. C. F. Stiles (March 24): The first report of green bugs reached me on March 21 from Comanche County. A few spots of injury are showing up in volunteer oats that were not killed during the winter.

HESSIAN FLY (Elytorhaga destructor Say)

Missouri. L. Haseman (March 24): The hessian fly situation, as shown by a State survey that has just been completed, indicates that from the tier of counties along the Missouri River south the infestation is serious, practically all of the early seeded fields showing from 50 to 90 percent of the plants infested, and, in many cases, with fields seeded on the previously announced safe-seeding date showing 10 percent or more of the plants infested. Many of the worst infested fields have already been reseeded to oats and other fields will undoubtedly be abandoned later. In central Missouri we find considerable numbers of dead "flaxseeds", but the mortality seemingly is not due to parasitization. We do not believe, however, that the winter, with the fine blanket of snow, is responsible for their death.

Kansas. H. A. Bryson (March 26): E. G. Kelly reports hessian fly abundant with considerable damage to wheat in the 25 counties in southern and eastern Kansas.

Oklahoma. C. F. Stiles (March 24): The center of infestation seems to be around Billings, on the Noble and Garfield County line, in the heart of our best wheat-growing section. Some fields last fall had 60 percent infestation. Scattering reports have also been received from nearby counties stating that hessian flies are worse than they have been for a number of years.

CORN

CORN EAR WORM (Heliothis obsoleta Fab.)

Texas. W. L. Thomas and assistants (March 28): Examinations for eggs or adults of the cotton boll worm were made beginning March 12 in the upper coastal section of Texas, but none were found until the 23d. On that date 400 plants of alfalfa examined at three locations yielded 51 eggs; 4 adults were taken from 400 sweeps made on the same date; 15 eggs and 2 larvae were found on 200 stalks of corn 6 inches high. Near College Station on March 10, 2 eggs were found out of about 1,500 alfalfa plants examined; on March 12, 500 plants were examined and 1 egg found; and 8 eggs were found on 3,000 alfalfa plants examined on March 23 and 24.

F. A. Glick (March 17): Corn ear worm is quite abundant now around Brownsville, having appeared on March 15, both in the field and at lights. We are making infestation counts of larval damage to young corn.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Rhode Island. A. M. Stene (March 27): The corn borer is not unusually abundant, but little mortality is showing up among those that went into winter quarters last fall.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (March 20): The alfalfa weevil is doing very little damage. Injury is noticeable in only one field, located at Irvington, which is ready to be harvested, and it is expected that damage will cease as soon as it is cut. Over much of the San Francisco district and the San Joaquin Valley the alfalfa is reaching maturity and harvest has already started in a number of fields. In the San Francisco Bay area parasitization by Bathyplectes curculionis Thoms. continues to be heavy, but no reports later than March 3 are included because the rearing records beyond this date are not yet completed. Very few of the Bathyplectes reared since February 26 are of the overwintering form.

FRUIT INSECTS

APPLE

APPLE APHIDS (Aphididae)

- Vermont. H. L. Bailey (March 25): Eggs of the green apple aphid (Aphis pomi DeG.) are moderately abundant at Shelburne and Charlotte, in Chittenden County.
- Connecticut. P. Garman (March 23): Aphid eggs are abundant in nearly every orchard visited in New Haven County. Those hatched so far in the laboratory are of the green apple aphid.
- New York. P. J. Parrott (March 19): Aphid eggs are plentiful in western New York.
- Pennsylvania. H. E. Hodgkiss (March 24): Aphid eggs are generally abundant throughout the State.
- Virginia. W. J. Schoene (March 25): The newly hatched apple aphids were found on apple buds in the Roanoke section by March 14 and in the Crozet section by March 18. It appears now from the few observations made that a heavy infestation of the rosy aphid (Auraphis roseus Baker) will occur in Virginia orchards this year. The insects were observed on the foliage in large numbers last fall, also a few have been hatched prematurely by taking the eggs in the house.
- West Virginia. L. M. Fegins (March 28): I have reports from several sections, notably the Eastern Panhandle and Monongalia County, that aphid eggs are extremely abundant on apple. Eggs hatched in the laboratory prove to be about 40 percent green aphid (A. pomi) and 30 percent rosy aphid (A. roseus).
- Michigan. Ray Hutson (March 25): Aphid eggs are very plentiful throughout the fruit belt along Lake Michigan.
- Iowa. H. E. Jaques (March 25): Some apple trees show a rather heavy infestation of aphid eggs.
- Utah. C. J. Sorenson (March 19): Eggs of the green apple aphid and the rosy apple aphid are common in apple orchards in Boxelder County.
- Oregon. B. G. Thomson (March 17): Rosy apple aphid at Monroe, the first being found on March 17.



# LEAFHOPPERS (Erythroneura spp.)

Missouri. L. Haseman (March 24): The two common species of apple leafhoppers, the red-spotted (E. maculata Gill.) and the red-striped (E. obliqua Say) have survived the severe winter, though recent counts indicate between 40 and 50 percent mortality in leaf and grass coverage in the orchards at Columbia. These leafhoppers for the past two seasons have been very serious and we are hoping that the winter mortality may somewhat lighten up their numbers for the coming summer.

## SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

New York. F. J. Parrott (March 19): San Jose scale is common in many poorly sprayed and neglected orchards in western New York.

Virginia. W. J. Schoene (March 25): Examinations at various points in the State indicate that more San Jose scale is present than for several years.

Georgia. O. I. Snapp (March 3): Thirty-three thousand scales from unsprayed peach trees at Fort Valley were counted at intervals during the winter to determine the percentage of live scale in an orchard being used for experiments. The results are given in the following table.

Date	Dead scales	Living scales
	<u>Number</u>	<u>Number</u> : <u>Percent</u>
January 13 to 21 .....	7,432	25,168 : 75.71
February 13 .....	241	359 : 59.83
March 3 .....	704	1,096 : 60.89

Live scale on unsprayed peach trees at Fort Valley decreased 15 percent between January 13 and March 3. This is believed to be due chiefly to the twice-stabbed ladybeetle (Chilocorus bivulnerus Muls.), rather than to cold weather, as we have shown heretofore that a minimum temperature of 16° F. will not kill the San Jose scale on peach trees in Georgia. The minimum temperature recorded at Fort Valley during the winter was 15°; however, this has been one of the coldest winters on record, not because of the unusually low temperatures but owing to a number of long periods with daily minimums below 32°.

C. H. Alden (March 23): There is good control of the scale in well-sprayed peach and apple orchards at Cornelia, but from moderate to severe infestations have been observed in unsprayed or poorly sprayed orchards.

Ohio. T. H. Parks (March 25): An examination made March 25 showed a high mortality at Columbus. Winter temperature reached -17° F., and only a very few of the insects survived.

J. S. Houser (March 28): A mortality record was made of scale taken from vigorous apple wood moderately infested at Sandusky. Of 500 individuals in the overwintering stage examined only 9 percent were alive. The condition of the scale varied greatly from twig to twig. On one lot of twigs only 1 percent of the scale was alive, whereas on another lot 23 percent were alive. The minimum temperature in this locality as reported by Mr. G. A. Runner was  $-12^{\circ}$  F.

Illinois. W. P. Flint (March 20): The weather of the past winter caused a very high mortality of San Jose scale. South of Carbondale from 10 to 20 percent of the scale is still alive. North of Carbondale the kill was very high on the west side of the State, being from 97 to 98 percent except on parts of the trees protected by snow; it was slightly less on the east side. In the area north from St. Louis more than 99 percent of the scale was killed.

Michigan. Ray Hutson (March 25): San Jose scale is very spotted in the fruit districts along Lake Michigan. There are places where trees not sprayed regularly for the scale show live scales.

Alabama. J. M. Robinson (March 21): San Jose scale is moderately abundant on peach trees.

Missouri. L. Haseman (March 24): This pest during the past summer built up rapidly in many sections of the State, encrusting many young fruit trees. The subzero temperatures and the prolonged cold have been very beneficial in killing off this pest. Recent counts from the latitude of Columbia and to the north indicate that on the most exposed trees above the snow line the mortality is nearly 100 percent, with some counts taken on sheltered places indicating sufficient carry-over to enable the pest to build up again this summer if conditions favor it. Much of the dormant spraying planned for northern Missouri will probably not be done in view of the effective kill by the cold weather.

Oklahoma. C. F. Stiles (March 24): A few of the orchard men report that the severe winter has killed a large percentage of the scale in the vicinity of Oklahoma City.

#### CODLING MOTH (Carrocarsa pomonella L.)

Georgia. C. H. Alden (March 23): The codling moth is still in hibernation at Cornelia; no pupation to date.

Ohio. T. H. Farks (March 25): An examination made yesterday shows that most of the overwintering codling moth larvae at Columbus were killed by the low winter temperature. The lowest reached was  $17^{\circ}$  below zero. Below-zero temperatures were recorded during 10 days.



Missouri. L. Haseman (March 24): The number of codling moth larvae going into hibernation last fall was the smallest for many years and, with temperatures ranging from nearly 20° below in the northern part of the State to from 10° to 12° or 15° below in central and southern Missouri, we have had a considerable kill of those hibernating above the snow line. Recent examinations, however, show that in central Missouri the winter mortality has not been 100 percent by any means, for we are finding considerable numbers of live larvae on the tree trunks above the snow line.

Colorado. G. M. List (March 17): Preliminary examinations at Fort Collins indicate about an average winter mortality of codling moth larvae. With the large population that went into hibernation in most sections of the State, there will be a heavy flight of moths if the weather continues favorable.

Utah. C. J. Sorenson (March 19): A high percentage of codling moth larvae have survived the winter, judging from rather limited investigations in Box Elder County.

EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

New York and Delaware. L. F. Telt (March 24): Egg masses of the apple tent caterpillar are very abundant in many localities, although indications are that the outbreak will be less general than that of last year. Many egg masses are being collected by Boy Scouts and school children in various localities in New York State and New England. The egg masses appear to be less abundant in eastern Pennsylvania and in the vicinity of Wilmington, Del.

Vermont. H. L. Bailey (March 25): Tent caterpillar egg masses are moderately abundant in the southern part of the State; less so in northern sections.

Connecticut. W. E. Britton (March 23): Egg clusters are very abundant in some localities on wild cherry and apple throughout the State; in other localities they are less prevalent than in 1935.

Pennsylvania. H. E. Hodgkiss (March 24): There is a rather general abundance of the eggs of the eastern tent caterpillar.

Arkansas. W. J. Baerg (March 17): About one-third of the egg masses are hatching at Fayetteville today, the others hatched earlier; hatching probably began about March 13. Egg masses are moderately common, but not as abundant as they have been in recent years.

FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Svent (March 20): Reports of infestations of fruit and shade trees with the flat-headed apple tree borer came in during the winter and have continued up to date.



Kansas. H. A. Bryson (March 26): Flat-headed apple tree borers are very abundant in apples and other trees throughout the State. Infestation is due to the weakened conditions of the trees, resulting from drought and red spider or aphid injury during the past 3 years.

#### FLOWER THRIPS (*Frankliniella* spp.)

California. S. Lockwood (March 20): Two closely related species of thrips, *F. tritici californica* Moul. and *F. minuta* Moul., are appearing in greater numbers than usual. Reports coming to the office indicate that they are very abundant in the blossoms of stone fruits.

#### EUROPEAN RED MITE (*Paratetranychus vilosus* C. & F.)

Vermont. H. D. Bailey (March 24): Eggs of the European red mite are moderately abundant in orchards in Chittenden County.

Connecticut. P. Gorman (March 23): Eggs present in most of the orchards visited in New Haven County.

New York. P. J. Parrott (March 19): In the western part of New York, eggs of the red mite are not difficult to find on prunes and apples.

Pennsylvania. H. E. Hodgkiss (March 24): Eggs of the European red spider are more abundant than they have been for 2 or 3 years.

Michigan. Ray Hutson (March 25): European red mite is hatching at East Lansing.

#### CLOVER MITE (*Bryobia praetiosa* Koch)

Utah. C. J. Sorenson (March 19): Infestations of brown mite eggs in cherry and apple orchards in Box Elder County frequently encountered.

#### PEACH

#### PLUM CURCULIO (*Conotrachelus nenuphar* Hbst.)

Georgia. O. I. Sharpe (March 20): An unusual curculio situation exists at Fort Valley. Although petal fall of the first blooming varieties of peaches has occurred and during one period in March the maximum temperature was above 70° for 6 consecutive days, with a maximum temperature of 81° for March, practically no curculios have appeared from hibernation. Only four adults were caught after considerable jarring of various orchards on March 16 and none were taken by jarring on March 19. A number of peach growers report similar results from jarring

this week. (March 26): Adult curculios are now appearing from hibernation in numbers. An average of 0.9 beetle per tree was taken during jarring operations of outside rows of peach trees this morning. The insect is unusually late appearing from hibernation as peaches are now beginning to split the shuck. A mean of 60° F. or above was recorded on March 3, 4, 5, 9, 10, and 11. Full bloom occurred on March 10. A mean temperature above 60° F. was recorded on March 23, 24, 25, and 26, with maximums on those dates of 75, 80, 78, and 84, respectively.

C. H. Alden (March 24): Plum curculio still in hibernation at Cornelia. Jarred trees were in full bloom on March 23 but not a single curculio was caught.

T. L. Bissell (March 20): Today we jarred the first weevil of the season from wild plum at Experiment. We have been jarring 21 peach trees and some plum bushes every other day since March 13 and this is the first curculio. The trees were beginning to bloom March 13.

#### LESSER PEACH BORER (Aegeria pictipes G. & R.)

Georgia. O. I. Sharp (March 20): Emergence of spring-brood adults at Fort Valley has been taking place since March 1. Pupae nearly matured were recorded on February 25.

#### PEAR

#### PEAR THRIPS (Taeniothrips inconsequens Uzel)

Oregon. S. C. Jones (March 21): Pear thrips were found in the Umpqua Valley on March 13 and in the Willamette Valley on March 21.

#### RASPBERRY

#### SNOWY TREE CRICKET (Oecanthus niveus DeG.)

Utah. G. F. Knowlton (March 17): Red raspberries and blackcaps are heavily infested with snowy tree cricket eggs in a number of patches at Willard and Perry in Box Elder County.

#### GRAPE

#### GRAPE LEAFHOPPER (Myrthronceura comes Say)

Utah. G. F. Knowlton (March 3): Grape leafhoppers have survived in unusually large numbers at Logan and are present and active on warm days in the vicinity of all grape patches and Virginia creepers examined to date. (March 2): Adult females and some males of E. comes ziczac Walsh and E. elegans McAtee are emerging from hibernation.

## CITRUS

### GREEN CITRUS APHID (Aphis spiraeicola Patch)

Florida. J. R. Watson (March 19): A. spiraeicola is rather scarce again this spring, owing to unfavorable weather conditions during the winter, which prevented any tender growth on citrus. The Chinese ladybeetle, Leis conformis Sdv., emerged in large numbers from apparent hibernation during the first part of March and is doing very effective work in controlling this aphid in the northern part of Orange County. It has considerably extended its range.

### CITRUS WHITEFLY (Dialeurodes citri Riley & How.)

Florida. J. R. Watson (March 19): Whiteflies have commenced to emerge but in small numbers.

W. T. Fernald (March 21): The adults of the citrus whitefly are now beginning to appear at Orlando. It is too soon to tell whether they will be very abundant.

Mississippi. C. Lyle and assistants (March 25): Specimens of the citrus whitefly on Cane jasmine were received from a correspondent at Anguilla on March 9. Medium damage to this flower has been observed at Goodman. Citrus, Cane jasmine, and other bushes at Moss Point have been completely covered with the black fungus that follows whitefly infestations. Infestations on citrus have been reported from Pearl River, Jackson, and Harrison Counties.

### CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (March 24): Only one recurrence of California red scale was found this spring in Tucson on ornamentals that were treated the previous season. The scale was observed on March 21 on a rosebush in a yard in Tucson.

### FLORIDA RED SCALE (Chrysomphalus aonidum L.)

Mississippi. J. F. Kislan'ko (March 25): Leaves of Ligustrum infested with the Florida red scale were sent to this office from Higgins on March 10.

### CITRUS THRIPS (Scirtothrips citri Moul.)

Florida. J. R. Watson (March 19): Due to the unseasonably cold winter, which kept weeds and other host plants from blossoming, thrips are very scarce this spring. The average is only two or three in a citrus bloom. Citrus bloom has been very heavy which, of course, has also helped to bring down the average infestation per blossom.



FLOWER THRIPS (Frankliniella tritici Fitch)

Arizona. C. D. Lebert (March 24): The flower or grain thrips is abundant on flowers and on citrus. A few of the citrus grovers were applying the first dust from March 15 to 20.

CITRUS RUST MITE (Phyllocorpes oleivorus Ashm.)

Florida. J. R. Watson (March 19): With the coming of warmer weather, rust mites on Valencias and other citrus fruits still on the trees have necessitated considerable dusting and spraying.

CITRUS RED MITE (Paratetranychus citri McG.)

Florida. J. R. Watson (March 19): The purple mite is rather common on citrus.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Georgia. T. L. Bissell (March 2): Larvae abundant on patch of turnip at Tifton. Last year this weevil was injurious in the same place on turnip, rape, and radish. (March 28): Pupae of the vegetable weevil, mostly dead from the cold, were found in abundance in the soil about turnips at Clarkston, De Kalb County. A few half-grown larvae were feeding on spinach.

Florida. E. W. Berger and G. B. Merrill (March 23): Found on turnip roots at Jacksonville.

Alabama. J. M. Robinson (March 21): The vegetable weevil has been pupating during the month at Auburn. Many of the adults are well formed. None has yet emerged from the soil.

Mississippi. C. Lyle and assistants (March 25): The vegetable weevil has done considerable damage to turnips and carrots in the field and to tomatoes in coldframes in Covah and Lincoln Counties, and from light to severe injury to turnips, cabbage, and other young plants in Leflore, Holmes, Yazoo, Attala, and Leake Counties. Only light infestations have been reported from Jackson and Harrison Counties, and fewer complaints have been received from Pearl River County than at the same time in recent years.

Texas. F. L. Thomas (March 30): The vegetable weevil has been found causing injury in Bell, Bastrop, and Brazoria Counties, the former about 300 miles from any known previous infestation.

California. S. Lockwood (March 20): The vegetable weevil was found infesting celery in the Chula Vista (San Diego County) area during the latter part of February. In some celery fields grown close to citrus orchards with mallow or mustard cover crops, the loss was severe. In other areas the damage was much less. In all cases the relationship between the number of weevils in the celery and the amount of preferred plants, such as mallow and mustard, could be definitely seen.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

Georgia. O. I. Sharp (March 16): The 12-spotted cucumber beetle is about as abundant as usual at this time of the year on peach trees at Fort Valley.

T. L. Bissell (March 2): Occasional adults feeding on turnip, vetch, lupine, and cabbage plants at Tifton. (March 16): The first beetles out of hibernation were seen on February 23 on Austrian peas at Experiment. On March 10 they were common on vetch and, beginning with that date, they have been abundant in peach blossoms. Very few males have been found. Eggs have been laid regularly since February 29 in the insectary.

Mississippi. C. Lyle and assistants (March 25): The 12-spotted cucumber beetle has been numerous in some plantings of turnips at Meridian. It was also injuring turnips at Durant on March 12 and was observed generally over Jackson and Harrison Counties.

Louisiana. B. A. Osterberger (March 21): Twelve-spotted beetles have been seen in an alfalfa field at Baton Rouge but not in large numbers.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Florida. J. R. Watson (March 19): The southern green stinkbug hibernated more generally than during most winters. It is now emerging but apparently in smaller numbers than usual.

FALSE CHINCH BUG (Nysius ericae Schill.)

Utah. G. F. Knowlton (March 16): False chinch bugs are now active on warm days in Cache Valley.

CHANGA (Scapteriscus vicinus Scudd.)

Florida. J. R. Watson (March 19): Male crickets are about as usual in truck fields and gardens. As usual, the most destructive is the chunga.

SEED CORN MAGGOT (Hyalemyia ciliatipura Rond.)

Virginia. H. G. Walter (March 26): Adults of the seed corn maggot are rather abundant in the fields around Norfolk.

POTATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Mississippi. C. Lyle and assistants (March 25): Colorado potato beetle observed in gardens at Senatobia on March 19. Beetles have not been noticed around Jackson. The first adult Colorado potato beetle was observed on March 14 before any potatoes were showing above the ground in the vicinity of Leland.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Delaware. L. A. Stearns (March 18): At Newark the mortality of 20,000 Mexican bean beetles placed in hibernation cages with suitable cover and intended for test purposes was 100 percent. Usually better than 50 percent survive under such conditions.

Ohio. W. F. Howard and H. C. Mason (March 23): The survival of the Mexican bean beetle in cages at Columbus was 2.14 percent on March 12, which is the lowest it has been for a number of years. The survival was 5.57 percent during the same period in 1935 and about 33 percent in 1934.

BANDED CUCUMBER BEETLE (Diabrotica balteata Lec.)

Mississippi. H. Gladney (March 25): A few banded cucumber beetles observed on some early planted beans in Jackson County.

PEAS

PEA APHID (Illinoia nisi Kalt.)

Virginia. H. G. Walker (March 26): The pea aphid, which was unusually scarce during the winter, is rapidly becoming moderately abundant on alfalfa at Norfolk.

Mississippi. H. Gladney (March 25): A light infestation of the pea aphid was noticed on a planting of English peas in Harrison County.

Kansas. H. R. Bryson (March 26): Pea aphids have not been observed in alfalfa fields to date.

Oregon. K. E. Gray (March): Found hatching on Scotch broom on March 1 at Astoria.



CABBAGE

CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Walker (March 26): In general, cabbage aphids and the spinach aphid (Myzus persicae Sulz.) are very scarce in the Norfolk area; however, a 15-acre field of young cabbage plants was found to be very heavily infested with the cabbage aphid.

Georgia. T. L. Bissel (March 2): The cabbage aphid is moderately abundant on young plants ready for shipment, but it does not appear to be injurious.

Mississippi. C. Lyle and assistants (March 25): Heavy infestations of the cabbage aphid at Lexington, Sallis, and Lucedale. This insect is rather numerous in cabbage beds at Aberdeen. It caused medium injury to cabbage in Lincoln and Coriah Counties, and was observed on cabbage and collards in Jackson and Harrison Counties during the month.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Georgia. T. L. Bissell (March 16): A few adults, the first of the season, were seen on collard at Experiment today.

Alabama. J. M. Robinson (March 21): The harlequin cabbage bug is beginning to appear on greens.

Mississippi. D. W. Grimes (March 25): Several specimens of the harlequin cabbage bug were collected from turnips at McAdams on March 12.

Louisiana. B. A. Osterberger (March 3): Only a very few adults noticed in an old cabbage field at Baton Rouge.

Texas. F. L. Thomas (March 16): The county agent at El Paso reports that farmers are complaining of these insects damaging young cabbage.

IMPORTED CABBAGE WORM (Ascia rapae L.)

Virginia. H. G. Walker (March 31): Large numbers of the imported cabbage butterflies appeared at Norfolk on March 28, and have been quite abundant since that date.

Mississippi. C. Lyle and assistants (March 25): The imported cabbage butterfly was observed on March 20 in rather large numbers in gardens at Poplarville and in greenhouses at Aberdeen during this month.

Louisiana. B. A. Osterberger (March 21): The cabbage butterfly has been active during the warmer parts of the entire winter. Eggs are now very numerous on cabbage.

CABBAGE LOOPER (Autographa brassicae Riley)

Mississippi. L. J. Goodgame (March 25): The cabbage looper is present in greenhouses around Aberdeen.

Louisiana. B. A. Osterberger (March 21): Only a few cabbage looper eggs have been noticed.

CELERY

GREENHOUSE LEAF TIER (Phlyctaenia rubigalis Guen.)

Florida. C. B. Wisecup (March 24): Field examinations in the Sanford-Oveido area during February disclosed only an occasional adult of the celery leaf tier, with no larval damage apparent to the maturing celery.

TURNIP

TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Texas. F. L. Thomas (March 28): The turnip plant louse is causing considerable injury to young turnips following a dry spell at College Station; also injurious at Hitchcock, according to J. N. Roney.

STRAWBERRY

AN APHID (Capitonophorus fraxifolii Coll.)

Oregon. D. C. Mote (March): Wingless adults and young observed on strawberry plants at Corvallis on March 17 by W. D. Edwards.

COMMON RED SPIDER (Tetranychus telarius L.)

Texas. J. N. Roney (March 16): Severe infestations have developed in Galveston County.

Virginia. H. G. Walter (March 26): Red spiders continue to be rather abundant in some strawberry fields in the Norfolk district, while in other fields they are very scarce.

SUGAR BEETS

BET LEAPHOPPER (Eutettix tenellus Bak.)

Texas. F. L. Thomas (March 28): Specimens of the beet leafhopper, infesting spinach, were sent in from Winterhaven by S. L. Jones. Specimens of the leafhopper, infesting garden beets being grown for seed, were also sent in from El Paso.

## COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy (March 27): It seems that the boll weevil infestation in the vicinity of Florence will be light this spring. We have not found a single active weevil in the hibernation cages, and all we found in the moss were dead. We have been examining wood trash during the week and have found two live and four dead weevils.

Mississippi. E. W. Dunnam (March 21): No weevils have been seen or reported to date.

Louisiana. R. C. Gaines and assistants (March 28): No boll weevils have been taken on flight screens so far this month.

Texas. R. W. Moreland (March 28): Weevils have been active in hibernation cages at College Station during the entire month. On March 4, 84 were observed in the cages.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. A. J. Chapman (March 7): Both surface-trash and soil examinations show a heavy winter survival of the pink bollworm.

Mexico. C. S. Rude (March 3): Moth emergence started on February 21 at Tlahualilo, Durango. To date no emergence has been observed in any of the plots where irrigation has been given. (March 10): The emergence from the hibernation cages is about the same as in other years. (March 17): The emergence from the hibernation tests is building up steadily. To date the principal emergence has been from the treatments where no irrigation was given.

Puerto Rico. (L. C. Fife (March 21): All cultivated cotton fields in Boqueron were found infested but no field exceeded 10 percent. Mega (Montezuma speciosissima) was found lightly infested at Camuy, Quebradillas, and Aguadilla.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. K. E. Ewing and R. L. McGarr (March 21): The first flea hopper nymphs of the season were observed at Port Lavaca on March 5 and the first emergence from hibernation cages occurred on March 6. This is 3 weeks later than the average date of emergence for the past 3 years. The warm weather during the last 2 weeks has been favorable for emergence, and 5,975 flea hopper nymphs have emerged from the 3,800 plants under observation. This emergence is about twice as great as was observed last year on the same date. (March 28): Nymphs continue to emerge from the hibernation cages; however, there was no rapid increase in emergence during the past week.



A. J. Moreland (March 14): H. J. Reinhard reports that the first nymph emerged in cages at College Station on March 6. (March 21): A. H. Fletcher reported one nymph on evening primrose at College Station on March 19.

Arizona. T. P. Cassidy and W. A. Stevenson (March 23): At weekly intervals for the past month sweepings on the plant Sphaeralcea emoryi in the vicinity of Tucson have given negative results so far as this insect is concerned. In the Salt River Valley, however, nymphs were found on this plant on March 12.

## FOREST AND SHADE-TREE INSECTS

### CANKERWORMS (Geometridae)

Connecticut. P. Garman (March 23): Eggs of Alsophila pometaria Harr. abundant in some apple orchards in New Haven County.

Connecticut, New Jersey, and New York. E. P. Felt (March 25): Fall cankerworms will be abundant in southwestern Connecticut, southeastern New York, and northern New Jersey. Not only were many eggs laid last fall but numerous moths are flying this spring. The spring cankerworm (Paleacrita vernata Teck) is also in flight and there will probably be a considerable number of these.

Iowa. H. L. Jaques (March 25): Spring cankerworms have been flying since March 15.

Missouri. L. Haseman (March 24): There is promise of some trouble with this pest, at least through the central part of the State, the males having been flying now for 2 weeks, and during the past week females have been ovipositing.

Kansas. H. R. Bryson (March 26): According to E. G. Kelly, there are fewer cankerworms (both species) appearing on banded trees than for a number of years. Observations indicate a larger proportion of males than females.

Oklahoma. C. L. Stiles (March 24): The spring cankerworm has made its appearance in central Oklahoma and has been reported as feeding in large numbers on developing foliage of plum trees.

### TENT CATERpillARS (Malacosoma spp.)

Vermont. H. L. Bailey (March 25): Forest tent caterpillar (M. disstria Hbn.) egg masses are very abundant on maple in vicinity of Bellows Falls, Springfield, and Middlebury. No observations at other points in the southern part of the State where infestation was heavy last summer.

Texas. R. K. Fletcher (March 5): Tents just started at College Station.

GYPSY MOTH (Portheia dispar L.)

Rhode Island. A. E. Stene (March 27): Fewer gypsy moth egg clusters seen this year, but there are still enough to give considerable trouble the coming season.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Delaware. E. P. Felt (March 24): Bagworm is somewhat prevalent, though not excessively abundant, in the section around Wilmington.

Pennsylvania. R. M. Baker (March 24): The bagworm will be a serious pest in the western section of the State, centering around Allegheny County.

E. P. Felt (March 24): Bagworm is somewhat prevalent, though not excessively abundant, in southeastern Pennsylvania.

OYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

New York. P. J. Parrott (March 19): Heavy infestation in occasional apple orchards in the western part of the State.

Pennsylvania. E. P. Felt (March 24): Somewhat abundant in sections about Philadelphia, being observed in numbers on gray birch and golden-trigged dogwood.

ASH

BANDED ASH BORER (Neoclytus caprea Say)

Nebraska. M. H. Swenk (March): Heavy infestations of ash trees by larvae and beetles of the banded ash borer were reported from Dakota and Saunders Counties during the first week in March.

BIRCH

BRONZE BIRCH BORER (Agrilus anxius Gory)

Delaware. E. P. Felt (March 24): The bronze birch borer was found in numbers on a badly infested ornamental birch at Wilmington.

ELM

A BARK BEETLE (Hylurgopinus rufipes Eich.)

Connecticut. B. J. Kaston (March 24): Although not as frequently encountered as hibernating larvae, many adults hibernate in special tunnels between the outer and inner layers of bark, or entirely in the outer layer. They

may usually be found in more or less healthy trees in the vicinity of trees from which they emerged in the fall. Counts made at intervals during the winter reveal a very high proportion surviving the winter. Material from South Windham showed a high percentage of parasitization by a braconid which is present as prepupae in cocoons lying in the larval tunnels.

#### EUROPEAN ELM SCALE (Gossyparia snurria Mod.)

Colorado. G. M. List (March 17): Infestations of the European elm scale are heavy in most sections of the State. Only about a 50 percent winter mortality is indicated, not sufficient to be much of a factor in reducing the population.

#### PINE

#### PALES WEEVIL (Hylobius pales Boh.)

New York. E. P. Felt (March 24): Specimens of small white pines infested with Pales weevil were received from East Norwich, accompanied by the statement that there was considerable injury.

#### A PINE NEEDLE MINER (Paralechia pinifoliella Chamb.)

Connecticut. G. H. Flumb (March 17 and 24): Small slender brown larvae from 3 to 3.5 mm long were observed boring into the needles of pitch pine.

#### WHITE-PINE APHID (Cinara strobi Fitch)

New England. E. P. Felt (March 24): Eggs of the brown pine aphid (Dilachnus strobi) are rather common on the needles of white pine in southern New England. In addition, similar eggs, though presumably of a different species, were found on Scotch pine and red pine. Eggs are rather common on needles of white pine in the Wilmington, Del., area and in southeastern Pennsylvania and New York.

#### PINE BARK APHID (Pineus strobi Htg.)

New England and Pennsylvania. E. P. Felt (March 24): The pine bark aphid is somewhat noticeable, though not excessively abundant, on white pines in southern New England and also in the Philadelphia area.

#### PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Vermont. H. L. Bailey (March 25): Pine needle scale very abundant on white pines in Colchester, Chittenden County.

New York. R. E. Horsey (March 23): Considerable numbers of scales with live eggs found on Austrian and Mugho pines, and a few on Swiss Stone



pine(Pinus cembra) at Rochester. They showed no winter mortality. Probably about 5 percent of the scales have been removed from the trees by the ice, not enough to count as a control measure, as plenty of scales with live eggs were still on the trees.

Pennsylvania. E. F. Felt (March 24): The pine leaf scale was found occasionally abundant on pine needles, especially on Austrian pines, in the Philadelphia district.

Colorado. G. M. List (March 17): The pine leaf scale is unusually numerous on spruce and pines in most of the cities of the State. In some localities the infestation is quite heavy on forest trees.

#### PLANE TREE

##### GIANT APHID (Longistigma caryae Harr.)

Pennsylvania. E. F. Felt (March 24): Eggs of the giant aphid were rather common on the under side of plane tree branches in the Philadelphia district.

##### SYCAMORE LACEBUG (Corythucha ciliata Say)

Pennsylvania. E. F. Felt (March 24): Lacebugs are somewhat abundant under the bark scales of American plane trees in southeastern Pennsylvania.

#### POPLAR

##### POPLAR VAGABOND APHID (Mordwilkoja vagabunda Walsh)

New York. R. D. Horsey (March 23): Shrivelled and dried remnants of the vagabond gall (Pemphigus vagabundus Walsh) are quite conspicuous on a number of poplars at Rochester.

#### SPRUCE

##### SPRUCE GALL APHID (Chermes abietis L.)

Delaware. E. F. Felt (March 24): The spruce gall aphid is somewhat prevalent in the vicinity of Wilmington, some trees being badly infested.

Pennsylvania. E. F. Felt (March 24): The spruce gall aphid is somewhat prevalent in southeastern Pennsylvania and some trees are badly infested.

New York. P. J. Parrott (March 19): Nymphs of the spruce gall aphid moderately abundant in western New York.

## TULIP TREE

### TULIP TREE SCALE (Toumeyella liriodendri Gmel.)

New Jersey. E. I. Felt (March 24): The tulip tree scale is generally prevalent and abundant on tulip trees in many localities in northern New Jersey.

Mississippi. C. Lyle (March 25): Japanese magnolia twigs infested with the tulip tree scale were received on March 14 from a correspondent at Purvis, with the statement that "the bush was covered with this growth."

## INSECTS AFFECTING GREENHOUSE AND ORNAMENTAL PLANTS

### COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Michigan. Ray Hutson (March 25): A few twigs of acacia from greenhouses in Detroit infested with I. purchasi were brought in the other day.

Florida. E. W. Berger and G. B. Merrill (March 23): Cottony-cushion scale seems to build up during the winter in many localities, but the Vedalia (Rodolia cardinalis Muls.), either naturally or reintroduced, effects a speedy control as the weather warms up in the spring.

Mississippi. G. L. Bond (March 25): There is quite a heavy infestation of the cottony-cushion scale at Pascagoula. Vedalia beetles have been colonized on the properties and are expected to clean up the scale this spring and summer.

Arizona. C. D. Lebert (March 24): Very few calls have come to our attention in the Phoenix district this spring. Two or three residences have reported this pest on pittosporum, a landscape shrub which seems to be the most favorable host in the Salt River Valley.

### OLIVE SCALE (Parlatoria oleae Colv.)

Arizona. C. D. Lebert (March 24): Several infestations of the olive parlatoria scale were noticed on roses, privets, oleanders, and jasmine on the university campus at Tucson on March 20 and 21. The scale has been kept well under control by oil sprays in the past.

### CHAFF SCALE (Parlatoria bergandii Const.)

Mississippi. C. Lyle (March 25): Specimens of the chaff scale collected on March 16 from a property at Gulfport were sent to this office.

OYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

New York. R. E. Horsey (March 23): Oyster-shell scale with numerous live white eggs was found on several lilacs at Rochester. No sign of winter mortality. The winter was not exceptionally cold, 3° below zero being the lowest. The cold was continuous with few thawing days. No sign of scale forced off by the ice storm.

ACACIA

A LEAFHOPPER (Dilraneura kunzei Gill.)

California. H. J. Ryan (March 26): On March 16 a leafhopper, D. kunzei, was taken on silver wattle (Acacia decurrens dealbata) located in an orange grove near San Dimas. Judging from the extent of the injury, the infestation has been quite heavy on the acacia trees but the leafhoppers are not very abundant now. This leafhopper was first collected on silver wattle growing in Altadena in November 1932. The infestation at that time was light but evidences of injury indicated that the leafhoppers had at one time been very numerous. The orange trees adjacent to the two silver wattles at San Dimas show typical leafhopper damage and the extent of damage decreases, especially on the fruit (navels), as the distance from the acacia trees increases, and is noticeable for about 8 or 10 rows from the acacias.

ARBORVITAE

ARBORVITAE APHID (Lachnus thujaefilina Del Guer.)

Louisiana. B. A. Osterberger (March 21): Many aphids have been noticed around Baton Rouge on arborvitae.

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Labou.)

Delaware and Pennsylvania. E. F. Felt (March 24): The box leaf midge is locally abundant on ornamental box in the Philadelphia district and in the vicinity of Wilmington.

CAMELLIA

CAMELLIA SCALE (Lepidosaphes camelliae Holte)

Mississippi. C. Lyle (March 25): The camellia scale has been reported as fairly abundant in Pike and Lincoln Counties by Inspector M. D. Peets. Heavy infestations are present at Moss Point, according to Inspector G. L. Bond. Specimens of this scale from Canton and Gulfport have been received at this office.



DEODAR

DEODAR WEEVIL (Iissodes deodarae Hopk.)

Mississippi. C. Lyle (March 25): Several specimens of the deodar weevil and many injured twigs of Cedrus deodar have been sent to this office.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Const.)

New York. R. E. Morsey (March 23): Live eggs found under scale from badly infested Euonymus radicans venetus.

Delaware and Pennsylvania. E. F. Felt (March 24): The euonymus scale is somewhat generally prevalent on climbing euonymus in eastern Pennsylvania and around Wilmington, Del.

Mississippi. M. D. Feets (March 25): This scale is fairly abundant on euonymus in Lincoln, Copiah, and Pike Counties.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips gladioli M. & S.)

Mississippi. C. Lyle (March 25): Specimens of thrips on gladioli bulbs were received on March 14 from a correspondent at Quitman.

HOLLY

PUTNAM'S SCALE (Aspidiotus ancylus Putn.)

Delaware and Pennsylvania. E. F. Felt (March 24): Putnam's scale is found in small numbers on American holly in the Philadelphia district and at Wilmington.

OLEANDER

OLEANDER CATERPILLAR (Syntomeida epilais Walk.)

Florida. J. A. Watson (March 19): The oleander caterpillar is doing considerable damage in the central and southern parts of the State. In the more northern sections it was exterminated by the freeze of December 1934 and has not yet reinfested the district.

PITIOSPORUM

AN APHID (Aphididae)

Louisiana. B. A. Osterberger (March 21): A green undetermined aphid is found to be very numerous on pittosporum stunting the young trees.

RHODODENDRON

RHODODENDRON LACEBUG (Stenhanitis rhododendri Horv.)

New England, New York, and Pennsylvania. D. F. Felt (March 24): The rhododendron lacebug is somewhat abundant on rhododendrons in southern New England, New York State, and eastern Pennsylvania, being most numerous on plants in sunny locations.

STOCKS

DIAMOND-BACK MOTH (Plutella maculipennis Curt.)

Massachusetts. A. I. Bourne (March 9): Larvae and moth sent in by a florist in Holyoke on March 5 with the report that the larvae were doing considerable damage to stocks in his greenhouse. (Det. C. Heinrich.)

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

CATTLE

TRUE SCREW WORM (Cochliomyia americana C. & F.)

General. F. C. Bishop (March 25): Field observations indicate that the screw worm fly (C. americana) was able to overwinter only as far north as Dixie, Gilchrist, Alachua Putnam, and Flagler Counties in north-eastern Florida. A few infestations of animals have occurred in counties along the Georgia-Florida line, indicating that there has already been some migration of the pest from the area where it overwintered. In Texas the fly overwintered only as far north as Val Verde, Kinney, Maverick, Uvalde, Frio, Atacosa, Wilson, Gonzales, Harton, and Brazoria Counties. Spring outbreaks have been reported from Uvalde and Val Verde Counties. Phenological data indicate that vegetation is advancing at Uvalde from about a week to 10 days earlier than normal, affording some evidence that trouble from screw worms may begin earlier than usual in this section.

CATTLE GRUBS (Hypoderma spp.)

Alabama. J. M. Robinson (March 21): Ox warble larvae were pupating the latter part of February and early in March in Auburn.

Mississippi. M. Brunson (March 21): In Noxubee, Winston, and Kemper Counties an examination of 265 head of cattle showed only 3 infested animals. Stockmen stated that their animals were heavily infested during the winter but most of the grubs had now dropped to the ground. Ox warble flies were observed about March 14 in Copiah County.

North Dakota. F. D. Butcher (March 21): Animals being killed at a packing plant at West Fargo carry a low infestation of cattle grubs. Observations made by a practicing veterinarian in the area west of Devils Lake indicate that infestation of cattle grubs in that area is spotted, with some herds practically free and others carrying a normal number or more this year. In the southeastern part of the State some calves brought in for 4-H Club boys are showing very heavy infestations, with a few records of as high as 50 grubs per animal. These calves were shipped in either from Alberta or Saskatchewan and are more heavily infested than are feeding animals originating in the same areas.

Missouri. L. Haseman (March 24): Generally throughout the State this past winter we have had the smallest number of ox warbles in the backs of cattle that we have observed for several years. Only an occasional herd has been reported as showing severe infestation.

Arkansas. W. J. Spicer (March 25): Cattle owners in Fulshear, Lonoke, and White Counties report heavy infestations of "volves" in the backs of cattle this year. They say they have some every year, but that this year there are more than usual. One owner of El Paso, White County, has 200 head of cattle and reports 85 percent of them infested.

BUFFALO GNATS (Eusimulium spp.)

Mississippi. M. Brunson (March 25): Stockmen in the Delta section state that up to the present time they have not been troubled with buffalo gnats.

H. L. Douglass (March 25): In the vicinity of Charleston the week of March 15 a few buffalo gnats, probably E. pecuarum Riley, were noticed near the Tallahatchie River.

SPINOSE EAR TICK (Ornithodoros magnini Duges)

Kansas. H. A. Bryson (March 26): Numbers of reports of the spinose ear tick in western Kansas.



HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

- Pennsylvania. A. B. Chaplain (March 13): Winged termites, R. flavipes Kol., are swarming in and about dwellings. Called into several places in the city for consultation.
- District of Columbia. R. A. St. George (March 25): The first flight of the season of the subterranean termite (R. flavipes) was observed out-of-doors today in Washington, D. C. A swarm of considerable size began about 9:30 a.m. and continued at intervals for nearly an hour. Sparrows and small ants captured many of them before they had either flown away or had shed their wings and could reenter the ground. This species has been emerging inside of heated buildings at intervals during the past month.
- West Virginia. L. W. Peairs (March 28): My first record of termites is from Clarksburg, where they emerged on March 22 in a heated basement.
- Georgia. C. H. Alden (March 15): Swarms of termites were observed at Cornelia on March 15.
- Florida. J. R. Watson (March 19): Termites have been swarming for some weeks in about the usual numbers.
- Alabama. J. M. Robinson (March 31): Termites have been swarming all over Alabama during March.
- Mississippi. C. Lyle (March 25): Many complaints regarding damage by termites have been received from all parts of the State during the past month.
- Louisiana. B. A. Osterberger (March 31): Termites have been swarming almost the entire month of March.
- Missouri. L. Haseman (March 24): We have been getting the usual number of complaints from home owners.
- Kansas. H. R. Bryson (March 26): Termites are active and a few swarms have been observed. About the usual number of reports of infestations have been received.
- Texas. F. L. Thomas (March 28): Termites reported from Farmersville on March 23.

ANTS (Formicidae)

Alabama. J. W. Robinson (March 21): Fire ants (Solenopsis xyloni McCook) are causing considerable damage to truck crops in Baldwin and Mobile Counties. In Baldwin County the colonies have developed sufficiently to be of considerable concern. Argentine ants (Iridomyrmex humilis Mayr) are active in various cities in the State.

Mississippi. C. Lyle (March 25): Many complaints of the Argentine ant have been received, especially from the localities where no control measures were taken during the past year. A resident at Jackson reported damage to clothing by the fire ant (S. xyloni). Inspector H. Gladney states that this ant has been observed around rose bushes in Biloxi. Inspector G. L. Bond reports that he has had several complaints of damage by this ant in March.

Nebraska. M. H. Svent (March 21): A Douglas County correspondent reported the infestation of a residence basement with the basement ant (Lasius interjectus Mayr) during the first week in March.

A SLIDER BEETLE (Ptinus tectus Boieldieu)

Washington. M. H. Hatch (March 20): This insect, originally found in warehouses on the Seattle water front, is becoming more widely distributed in the city. This winter specimens have occurred in dried fruit obtained from a local grocery store and in a dwelling house north of the city.

# INSECT PEST SURVEY BULLETIN

---

Vol. 16

May 1, 1936

No. 3

---

## THE MORE IMPORTANT RECORDS FOR APRIL 1936

Within the next few days Brood X of the periodical cicada will be appearing in the Northern States and Brood XXII will be appearing in Louisiana and Mississippi. We wish to call the attention of our collaborators to the desirability of our receiving observations of this insect in as many definite localities as possible.

During the latter part of April, the Mormon cricket began hatching in enormous numbers in parts of Idaho and western Montana.

The army cutworm was seriously damaging alfalfa and small grain in Oklahoma and Colorado, and cotton in parts of Texas. Cutworms were also reported from a number of other States.

Several species of wireworms were reported as appearing in abnormal numbers in parts of Washington and the adults were reported as damaging fruit buds in California.

Chinch bug flights were reported about the middle of the month in Illinois. High winter mortality occurred in Oklahoma.

Considerable hessian fly infestation is reported from southeastern Kansas. The late fall brood was very materially reduced by the severe winter, but the early fall brood came through the winter with but little mortality.

Apple aphids are occurring in greater numbers locally in the northeastern part of the country than for the last few years. In the Pacific Northwest they are scarce.



The codling moth started pupating in the third week of the month in Delaware, and adults were observed in Georgia the middle of the month. In the East Central States pupation started the second week of the month and in the Great Basin was well under way the third week of the month.

The eastern tent caterpillar was hatching in considerable numbers throughout the New England, Middle Atlantic, South Atlantic, and lower Mississippi Valley States early in April. This insect appears to be moderately abundant throughout this area.

Pupation of the oriental fruit moth was practically completed in Delaware during the month and adults were observed in Virginia about the middle of the month. In Georgia, eggs began hatching during the second week in April.

For the first time since the Japanese beetle has been known to occur in the United States, this insect suffered considerable winter mortality in certain parts of the older infested areas.

The four-spotted tree cricket was damaging raspberries so seriously in the Lewiston district of Idaho that control measures were necessary.

Cold, wet weather in the Charleston district of South Carolina was followed by considerable injury by the seed corn maggot.

The tomato pinworm surviving the winter on old tomato plants is heavily infesting the new fields in the Santa Ana district of California.

Hundreds of acres of cabbage in Mississippi were plowed under on account of heavy cabbage aphid infestations.

A heavy infestation of forest tent caterpillar was reported from the southern part of Mississippi, sweet gum and oak being defoliated in four counties.

Larvae of Halisidota ingens Hy. Edw. are seriously damaging ponderosa pine in the Apache National Forest in Arizona.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

South Dakota. H. C. Severin (April): No eggs hatched yet out of doors. Brought in some eggs from two areas, one covered by snow throughout the winter, the other not so covered. Eggs in both lots have hatched in approximately the same numbers and at the same time in the laboratory.

MORMON CRICKET (Anabrus simplex Hald.)

Montana. A. L. Strand (April 22): The warm weather of the past 10 days has caused the hatching of Mormon crickets in large numbers in southern and western Montana.

Idaho. C. Wakeland (April 21): Mormon crickets began hatching in the districts near Boise March 15, and now are hatching in numbers at Riggins in Idaho County and near Mountain Home in Elmore County. After beginning to hatch they were held in check for 2 weeks by cold weather. The higher areas are later than normal and no hatching has been reported in eastern Idaho, but in the warmer, lower areas enormous hordes are now beginning to attack range vegetation.

CUTWORMS (Noctuidae)

Alabama. J. M. Robinson (April 21): Cutworms are very abundant, attacking vegetables, particularly during the last week of March and the first week of April.

Mississippi. C. Lyle (April 24): Cutworms have apparently caused more damage this spring than usual. Injury to cabbage, tomatoes, young beans, and other plants has been general.

Iowa. H. E. Jaques (April 24): Many cutworm larvae are in evidence.

Kansas. H. R. Bryson (April 7): Cutworms (Chorizagrotis auxiliaris Grote) are very plentiful in grass lands and wheat in Harper, Sumner, and Bourbon Counties. Most of them are army cutworms, but some small variegated cutworms (Lycophotia margaritosa saucia Hbn.) are present. Cutworms in general are not as plentiful as in the past two seasons.

Oklahoma. F. A. Fenton (April 20): The army cutworm (C. auxiliaris) caused serious injury to first-year alfalfa and oats in Alfalfa County.

Colorado. S. C. McCampbell (April 8): We have received reports from most of the counties of eastern Colorado of damage by C. auxiliaris; however, we have had a snow or two every week and very cold weather. (April 18): We are being besieged with reports from northeastern Colorado.

Texas. F. L. Thomas (April 22): On April 10 cutworms had destroyed almost 60 acres of cotton in Brazoria County.

R. E. McDonald (April 20): Cutworms are reported as damaging alfalfa in the southern end of the Mesilla Valley.

Utah. C. J. Sorenson (April 24): A few climbing cutworms are attacking peach trees.

California. C. S. Morley (April 3): Cutworms appeared to be very plentiful in vineyards in Kern County; however, all vineyardists used tanglefoot on their vines and prevented serious injury.

J. C. Elmore (April 2): Variegated cutworm (L. margaritosa saucia) is common on tomato vines near Niland, attacking fruit and foliage. Losses are not unusually heavy.

#### MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

New Jersey. W. P. Yetter, Jr. (April 20): The first specimen of the mourning-cloak butterfly in spring flight was observed at Moorestown on March 15.

#### A CABBAGE BUTTERFLY (Pieris monuste L.)

Florida. H. T. Fernald (April 13): No evidence of migratory flight of P. monuste as yet at Orlando. Adults are scarce inland; slightly abundant on the west shore of the Indian River between Indian River City and Cocoa; quite abundant opposite Cocoa across Indian River (1 mile wide there) and increasingly abundant all the way out to the outer beach (approximately 10 miles by road; perhaps 5 miles air line). Abundant on eastern side near outer beach but without drift in any one direction as yet.

#### WIREWORMS (Elateridae)

Washington. M. C. Lane (April 20): At Prescott and Pendleton damage from Great Basin wireworm (Ludius noxius Hyslop) is showing up to a greater extent this year than normally, because of the extent of winter injury to wheat, resulting in a thin and weak stand.

M. C. Lane and H. P. Lanchester (April 22): Adults of the Pacific coast wireworm (Limonius conus Lec.), the sugar beet wireworm (L. californicus Mann.), and the western field wireworm (L. infuscatus Mots.) have been emerging and mating in unusually large numbers at Walla Walla. This intense activity resulted from the unseasonably warm weather of the past 2 weeks which has materially shortened the normal emergence period. Oviposition is taking place. Some damage by larvae to potato seed pieces has been noted.



California. C. S. Morley (April 3): Click beetles were found doing slight injury to young grapevines in the Arvin district, Kern County.

R. S. Wagner (April 13): Adults of L. canus are causing serious damage to unfolding buds of President plums grafted in 1935 to French prune stocks in a planting of 80 trees in the Kings River bottoms near Sanger. In many instances the entire bud was eaten.

WHITE GRUBS (Phyllophaga spp.)

Wisconsin. C. L. Fluke (April 20): No regular flight of June beetles has been observed to date. Several specimens of P. tristis Fab. have been collected at the ground surface during the few warm days of mid-April and one was found the last of March in Dane County.

Alabama. J. M. Robinson (April 21): The brown June bug (P. micans Knoch) has been emerging at night and returning to runways in the soil in the morning. They have become pests around lights on porches and in buildings.

Georgia. G. F. Moznette and S. O. Hill (April 14): Large numbers of May beetles have appeared in the vicinity of Americus and Albany during the week of April 14 and have been quite abundant since. The beetles have done considerable damage to the new growth on pecan trees.

T. L. Bissell (April 16): May beetles are now very abundant at lights at Griffin. They were first noted on April 13. Feeding has not been observed.

Mississippi. H. Gladney (April 24): May beetles are doing considerable damage along the Mississippi coast to Japanese persimmons and pecans.

Louisiana. B. A. Osterberger (April 23): During the entire month June bugs have been active on the warmer nights.

Kansas. H. R. Bryson (April 20): Population of white grubs not so heavy as usual following the year of beetle emergence.

Texas. F. L. Thomas (April 22): On April 13 the first record of P. submucida Lec. for the current season came from Dimmit County, collected by S. E. Jones.

JAPANESE BEETLE (Popillia japonica Newm.)

New Jersey. C. H. Hadley (April 23): Conditions during the winter of 1935-36 were such that for the first time since the beetle has been known to occur in the United States there has been considerable mortality of the grubs at certain places in the infested area, owing to the extremely cold weather, coupled with lack of a sufficient blanket of snow. However, the destruction of the grub population in the soil is not general or uniform throughout the infested area, but is most evident in southern New Jersey and eastern Pennsylvania.

Pennsylvania. R. M. Baker (April 22): From 1 to 12 larvae per square foot were found in grass roots in Cumberland County. No indication that the winter had killed larvae. The snow was deep over this section all winter.

### COMMON RED SPIDER (Tetranychus telarius L.)

Virginia. H. G. Walker (April 21): The red spider continues to be relatively abundant in some strawberry fields at Norfolk and may cause serious injury under favorable weather conditions unless control measures are applied.

Mississippi. C. Lyle and assistants (April 24): Heavy infestations of red spiders have been observed during the past 15 days on azaleas and camellias at Moss Point. Red spiders are less abundant on camellias at Poplarville than they were last month, but they are fairly abundant on arborvitae in southwestern Mississippi.

Ohio. N. F. Howard (April 21): Hydrangeas in a greenhouse at Columbus were very heavily infested on April 4.

Kansas. H. R. Bryson (April 10): Large numbers of red spiders are present in northeastern Kansas.

Idaho. C. Wakeland (April 21): Common red spider emerged at Lewiston on April 15, where it was feeding on young mustard plants.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT

#### CHINCH BUG (Blissus leucopterus Say)

Indiana. C. Benton (April 17): No flight from hibernation quarters observed to date at Lafayette. Bugs were stirring in grass clumps on April 14 when the maximum air temperature reached 77° F., but on exposure to sunlight showed a tendency to hide rather than to fly. From 50 to 100 or more live bugs per clump of Andropogon could be found on that date.

Illinois. W. P. Flint (April 20): Flight was reported in central Illinois for the first time this year on April 14, with heavy flight on April 20. There has been considerable activity in the cover and some crawling out of the bugs from the overwintering shelters to nearby wheat fields.

Ohio. T. H. Parks (April 24): A survey made in five north-central counties shows an average of only two bugs per square foot of timothy clump. This is from one-third to one-half of the number found last fall and indicates a winter mortality of over 50 percent. From present indications, there will be no chinch bug outbreak this year in Ohio.



Iowa. H. E. Jaques (April 24): The chinch bug is sufficiently abundant in southeastern Iowa to threaten danger if conditions are favorable.

Kansas. H. R. Bryson (April 6): Not many chinch bugs have been found in clumps of grass at Wellington, according to E. G. Kelly. Up to this date none have entered the small grains. Very few bugs found in Bourbon County and in the vicinity of Manhattan, Riley County.

Oklahoma. F. A. Fenton (April 20): A spring survey from March 9 to 13 indicated that there was approximately 79.3 percent mortality of the chinch bug in Oklahoma and that the mortality in sorghum stubble was considerably greater than in bunch grass. An average of 3.1 bugs per square foot was found in sorghum stubble and 19 per square foot in bunch grass.

C. F. Stiles (April 22): Conditions during the past month have been favorable for chinch bug development.

#### HESSIAN FLY (Phytophaga destructor Say)

Indiana. W. B. Noble (April 17): Pupation of the hessian fly in the field began at Lafayette the last week in March. About 24 percent pupation by April 15. There has been no emergence to date. Apparently some of the earlier formed pupae were killed by the abnormally low temperatures early in April. (April 24): Field observations during the past few days give evidence of a very high winter mortality of the late fall brood in the area extending from Attica east to the Ohio line--much higher, in fact, than was indicated by earlier examinations. The practical elimination of this brood substantially reduces the danger of a severe spring outbreak in central Indiana. However, the early fall brood in volunteer and early sown fields, which reached the puparium stage well in advance of cold weather, suffered comparatively little mortality and may still be the source of considerable spring infestation.

Kansas. H. R. Bryson (April 8): Twenty-five counties in southeastern Kansas show considerable infestation. Some hessian fly was found last fall in Bourbon County but very little this spring. R. H. Painter, in a survey of Geary, Morris, Chase, Lyon, Coffey, and Osage Counties, found considerable variation in the infestations in these counties. In Chase and Neosho Counties wheat was heavily infested and a considerable amount of the wheat was killed by fly, wind, and dry weather.

#### FALSE WIREWORMS (Eleodes spp.)

Nebraska. M. H. Swenk (April 10): A Garden County correspondent reported on April 10 that the spring wheat in that vicinity was being destroyed by the plains false wireworm (E. opaca Say).

Kansas. H. R. Bryson (April 6): False wireworms seriously damaged some wheat fields last fall near Conway Springs. E. G. Kelly reports four fields abandoned near Wellington, and six at Anthony. E. suturalis Say adult was taken and E. opaca was plentiful at Anthony.



## A FUNGUS GNAT (Mycetophilidae)

Indiana. J. J. Davis (April 26): Fungus gnats have been exceedingly abundant in wheat fields throughout central Indiana during the last 3 weeks, leading growers to believe that hessian flies were out in unusually large numbers. Many growers were ready to plow up their wheat fields, until they learned the true nature of the insects.

## CORN

### CORN EAR WORM (Heliothis obsoleta Fab.)

Louisiana. B. A. Osterberger (April 20): Slight damage has been noticed by corn ear worm to young corn in St. Mary and Iberia Parishes.

Texas. R. W. Moreland (April 11): At College Station two eggs were found per 100 plants on 1,500 plants of alfalfa and three eggs per 100 plants on 600 plants of Texas bluebonnet (Lupinus subcarnosus) examined during the week. No eggs were found on L. texensis.

### SALT-MARSH CATERPILLAR (Estigmene acraea Drury)

Florida. J. R. Watson (April 23): Larvae were quite active in destroying corn in Manatee County. It has been somewhat in evidence in watermelon fields in Alachua County, but not nearly so injurious as it was 2 years ago.

### CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Georgia. T. L. Bissell (April 21): Small field corn at Pomona, Spalding County, is severely attacked by this flea beetle, with as many as 10 beetles to the stalk. There is much feeding on the leaves, which is easily confused with frost injury.

### SEED CORN BEETLE (Agonoderus pallipes Fab.)

Iowa. H. E. Jaques (April 24): The seed corn beetle, always quite abundant, seems unusually so this year in the southeastern part of the State.

## ALFALFA

### ALFALFA WEEVIL (Hypera postica Gyll.)

Utah. C. J. Sorenson (April 24): Adults of alfalfa weevil moderately abundant in Salt Lake Valley.

California. A. E. Michelbacher (April 21): In the San Francisco Bay area in two fields the average number of larvae collected per 100 sweeps of an insect net reached slightly more than 1,500, but no economic damage resulted. The amount of parasitization by Bathyplectes curculionis Thos. during this month has ranged from a little over 50 to more than 70 percent. In the Pleasanton district the greatest average number of larvae collected to 100 sweeps was 832,

with most fields showing a much lower count. Here parasitization has been close to 90 percent. In the San Joaquin Valley some very high weevil counts were made. At Patterson on March 31 the average number taken to 100 sweeps was 5,890. In this field some economic damage was done. On the same date near Vernalis one field showed an average count close to 2,500, but no economic damage resulted. Throughout this area the weevil population was the greatest yet encountered. Parasitization was very low and ranged from less than 1 percent to nearly 10 percent. The parasite has apparently become dispersed over most of the infested area.

#### LEAFHOPPERS (Cicadellidae)

Louisiana. B. A. Osterberger (April 23): Many undetermined leafhoppers have been found on alfalfa. Some yellowing of plants and girdling has been noticed at Baton Rouge.

#### TARNISHED PLANT BUG (Lygus pratensis L.)

Louisiana. B. A. Osterberger (April 23): The tarnished plant bug has been found in considerable numbers on alfalfa at the sugar station at Baton Rouge.

Kansas. H. R. Bryson (April 20): The tarnished plant bug is quite numerous at Manhattan.

#### A CRANE FLY (Tinula cunctans Say)

Kentucky. W. A. Price (April 25): Leather jackets (T. cunctans), 40 to the square foot, were found in a field of lespedeza at Mayfield. This field had been in lespedeza 4 years in succession.

#### VETCH

#### APHIDS (Aphidae)

North Carolina. C. H. Brannon (April 25): Vetch in peach orchards over a wide area in Scotland County is severely damaged by aphids.

#### SUGARCANE

#### SUGARCANE BORER (Diatraea saccharalis Fab.)

Louisiana. B. A. Osterberger (April 21): On April 21 cane borer adults were found at lights, and fresh eggs were collected at Franklin, Jeanerette, and New Iberia, but no Trichogramma minutum Riley have been found in any of the borer eggs collected.

SUGARCANE BEETLE (Euetheola rugiceps Lec.)

Louisiana. B. A. Osterberger (April 23): Ligyrus is doing considerable damage to the sugarcane in St. Mary Parish. Many "dead heart" stalks are found attacked. Several of the larger sugar planters are using trap lights in an effort to trap the beetle and some are employing several men who dig for them around injured canes, paying so much per beetle.

F R U I T I N S E C T S

TARNISHED PLANT BUG (Lygus pratensis L.)

Virginia. W. J. Schoene (April 23): Tarnished plant bugs were found very numerous in peach orchards in the Crozet section, sometimes a dozen or more on a tree.

Washington. E. J. Newcomer (April 21): At Yakima very little injury to fruit buds by tarnished plant bug has been reported, although bugs are present in the orchards. Up to April 10 the weather was cold and windy, which prevented activity. Since that time it has been unseasonably warm, and the buds have opened so rapidly that injury has been confined to individual buds rather than to clusters.

APPLE

APPLE APHIDS (Aphidae)

Connecticut. P. Garman (April 23): Apple aphids, Anuraphis roseus Baker, and Aphis pomi DeG., found in the field in New Haven County on April 15.

New York. N. Y. State Coll. Agr. News Letter (April): In the Hudson River Valley the apple grain aphid (Rhopalosiphum prunifoliae Fitch) started hatching March 25, the apple aphid the last 3 days in March, and the rosy apple aphid between April 1 and 6. Infestation by the grain and rosy aphids may be somewhat heavier than it has been for 2 or 3 years. In the Lake district the grain and rosy aphids commenced to hatch about the middle of April.

New Jersey. M. Kostal (April 9): The rosy apple aphid and the green apple aphid were exceptionally abundant on expanding apple buds at Morganville on April 5. The infestation indicates that it will be the heaviest for the past 5 years.

Pennsylvania. H. E. Hodgekiss (April 23): Eggs of the rosy apple aphid began hatching in Adams, Berks, Bucks, Philadelphia, York, Lancaster, Lebanon, Juniata, Franklin, Dauphin, and Cumberland Counties on April 1. In Chester and Delaware Counties they were hatched on March 25 and 26. In the east-central counties this species appeared on April 14 to 17. In the northeastern area eggs had hatched between March 31 and April 15. The green apple aphid and the grain aphid were present on partly



dormant buds several days in advance of the rosy aphid. The green apple aphid is the most abundant, the grain aphids not so abundant, and the rosy aphid infestation of moderate intensity. No aphids have as yet hatched in the northern tier of counties. Syrphid eggs are moderately abundant in all orchards.

Kentucky. W. A. Price (April 25): Green and grain aphids are now abundant in orchards in the central part of the State.

Michigan. Ray Hutson (April 20): Aphids are hatching in southwestern Michigan and the few specimens seen indicate that R. prunifoliae is the predominant species.

Washington. E. J. Newcomer (April 21): The various aphids attacking apple seem to be very scarce at Yakima this spring. It is probable that the low temperatures (3° to 5° F.) occurring about the first of last November interfered with the deposition of winter eggs, in the case of the rosy and green apple aphids, and also killed most of the woolly aphids (Eriosoma lanigerum Hausm.) that were above ground. The parasite Aphelinus mali Hald., however, was not entirely killed out, and adults have been emerging during the last few days.

#### SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Indiana. J. J. Davis (April 26): Winter mortality of the San Jose scale has been very high, but in many localities in the State where the 17-year cicada is abundant, insecticide control has been advised because the egg scars left by the cicadas will act as protective places for the scales.

Michigan. Ray Hutson (April 20): Infestations are quite spotted. High winter mortality observed in the vicinity of Benton Harbor, Lansing, and Muskegon. Specimens from South Haven showed only normal mortality.

Idaho. C. Wakeland (April 21): Owing to very cold weather late in the spring and a sudden change to midsummer temperatures, little dormant spraying was done in orchards and cherry trees broke into blossom before dormant sprays could be applied. Undoubtedly this situation will cause heavy increase of San Jose scale this year, for the insect is known to have wintered successfully.

#### CODLING MOTH (Carpocapsa pomonella L.)

Delaware. L. A. Stearns (April 20): Two percent of overwintered codling moth larvae pupated on this date.

Georgia. C. H. Alden (April 21): The first codling moth was caught in the experimental orchard bait pots at Cornelia on April 16. To date only 8 additional moths have been trapped. The weather has been too cold for much moth emergence to date and there has been no egg deposition.

Indiana. L. F. Steiner (April 23): Pupae of codling moth were first observed by A. J. Ackerman at Elberfeld, on April 10, and by S. A. Summerland at Bicknell, 50 miles farther north, on April 13. 50 percent of 51 surviving individuals found on and under trees at Elberfeld April 15 and 16 had pupated, but only 40 percent of 43 found on April 23 at Bicknell had transformed.

Illinois. W. P. Flint (April): Pupations of codling moth started in southern Illinois sometime prior to April 14, probably about the 10th.

Idaho. C. Wakeland (April 21): Codling moth larvae were beginning to pupate at Lewiston on April 15.

Utah. C. J. Sorenson (April 24): In Salt Lake Valley 12.6 percent of 127 overwintered larvae had pupated on April 20 and 24.8 percent of 326 overwintered larvae were found dead in hibernaculae April 13 to 20.

Washington. E. J. Newcomer (April 21): Low temperatures of 30° to 50° F. about the first of last November at Yakima had no apparent effect on codling moth larvae that were already established in cocoons for the winter, and temperatures during the winter were not low enough to cause any mortality. Pupation has been taking place for some time and moths should be emerging very soon.

EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

New England. E. P. Felt (April 24): The apple tent caterpillar has hatched in southern New England, and its abundance in a number of localities is indicated by the numerous small webs.

New Hampshire. L. C. Glover (April 25): The eastern tent caterpillar was observed hatching in Durham on April 14.

Connecticut. P. Garman (April 23): Tent caterpillars are abundant in many orchards in New Haven County, the larvae feeding on the unopened buds in some places. Hatching began on April 4 but cool weather has retarded their development.

New York. N. Y. State Coll. Agr. News Letter (April): Eggs were observed hatching the last of March and the first of April in the Hudson River Valley, and by the last of April tents were quite numerous.

R. D. Glasgow (April 27): The eastern tent caterpillar was hatching at New Rochelle on April 9, and at Albany during the past week. This insect promises to be fairly abundant again this year in parts of New York, even in some places where its great abundance during the past 2 years might have been expected to precede an abrupt decline to relatively insignificant numbers.

Delaware. L. A. Stearns (March 30): First hatching of eastern tent caterpillar was observed on March 30 at Newark.



New Jersey. T. L. Guyton (April 20): Eastern tent caterpillar is numerous on apple and wild cherry at Bound Brook; also noted on apple at Lebanon.

H. W. Allen (April 20): Eastern tent caterpillar not nearly so abundant in Burlington County as during 1935. A moderate number of tents are in evidence, but many clumps of black cherry have none. Less abundant on other host plants.

M. Kostal (April 9): On April 5 newly hatched larvae were noticed on apple trees at Morganville. Judging from the numbers of egg masses, the insect will again be present in large numbers.

Pennsylvania. R. M. Baker (April 21): Tents of the eastern tent caterpillar are about a week old. The larvae are feeding on unfolding apple leaves at Harrisburg, resulting in medium damage. Eggs began hatching at Berwick on April 9. They are very abundant.

H. E. Hodgkiss (April 23): The eastern tent caterpillar was forming webs in Adams County on April 1. In Mifflin County on April 13 eggs started hatching and 4 days later hatching was general in the county, which is close to the center of the State. The infestation appears to be general, as it was in 1935.

A. B. Champlain (April 19): Observed in Dauphin County on seedling apple, leaf buds first unfolding. The caterpillars are just hatching, and their nests are very small. Some larvae are clustered on opening leaf buds.

South Carolina. F. Sherman (April 20): Tent caterpillar is common on wild cherry. Larvae are now an inch long.

Georgia. O. I. Snapp (April 17): Recently hatched larvae were observed on wild cherry trees on March 31 at Fort Valley. The infestation is only moderate being considerably lighter than last year. Practically full-grown larvae were observed on April 17.

T. L. Bissell (April 8): One colony of small tent caterpillar larvae, apparently M. americana, observed on wild cherry at Experiment today. (April 23): A few full-grown caterpillars have been taken on wild plum bushes since April 18.

Mississippi. C. Lyle and assistants (April 24): Specimens of M. americana were collected at Jackson on March 31. Slight infestations on plum and peach were noted at Kosciusko, McAdams, and Durant.

Alabama. J. M. Robinson (April 21): Tent caterpillars have been active in trees during the latter part of March and early April.



APPLE FLEA WEEVIL (Orchestes pallicornis Say)

Indiana. A. J. Ackerman (March 31): Adults of the apple flea weevil are active on apple buds at Elberfeld.

FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Nebraska. M. H. Swenk (April 20): Reports of infestation of fruit and shade trees, including cherry, apple, cottonwood, elm, hackberry, boxelder, silver maple, etc., continued to be received during the period March 21 to April 20. These new complaints came from the southeastern one-third of the State.

Oklahoma. F. A. Fenton (April 20): The flat-headed apple tree borer is still in the larval stage.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (April): Eggs of the European red mite present in many orchards. None have been hatched at the present time.

New York. N. Y. State Coll. Agr. News Letter (April): Eggs of the European red mite were first observed hatching on April 16 in Rockland County and on April 24 in Dutchess County.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Delaware. L. A. Stearns (April 17): First overwintered adults of plum curculio jarred from peach trees at Bridgeville today.

Virginia. W. J. Schoene (April 21): The first curculios were taken at Crozet on April 8, and on April 14 the first individuals were taken from orchards in the Roanoke section, and were occurring in peach orchards in considerable numbers by April 21.

South Carolina. F. Sherman (April 20): D. Dunavan reports finding crescent cuts numerous on cultivated plum.

Georgia. O. I. Snapp (April 1): The peak of appearance of the curculio from hibernation at Fort Valley occurred on March 29, and by March 30 the beetles had reached the center of the orchards and were disseminated throughout the orchards. Shucks were being shed from a few peaches on March 31. Therefore, the dissemination of the curculio was unusually late this year in comparison with the development of the fruit. The appearance of adult curculios from hibernation has not been as heavy as anticipated. (April 8): The first eggs of the season were found today. The most advanced egg was about 4 days old. Very few eggs have been deposited to date, and none have hatched. (April 15): Although the peak of appearance of adults from hibernation in the Fort Valley area occurred on March 29, unusually late, very few eggs were deposited

until the week beginning April 13. Rain was recorded on 8 of the first 10 days of April for a total of 7.93 inches for that period. These rains with high winds and cool weather prevented oviposition of most of the adults until the time indicated above. (April 27): Larvae began leaving peach drops today, which is 13 days later than the first emergence last year.

T. L. Bissell (April 18): The curculio continues to be scarce on peach trees at Experiment. On April 16, 14 weevils were jarred from a small clump of wild plum and only 4 weevils from 21 peach trees. (April 23): Curculios continue to be found in small numbers on peach trees but on April 16 and 22 they were numerous on wild plum.

C. H. Alden (April 21): Curculios commenced emerging on March 23 in the Cornelia section and have been emerging in moderate numbers since that time. The highest catch in any one morning has been 25 curculios jarred from 10 trees. Commercial growers in the middle Georgia sections (Thomaston and Monticello) have reported catching over 2,000 in one morning's jarring operations.

G. F. Moznette and S. O. Hill (April 22): Half-grown larvae of the plum curculio at Albany were found in green peaches from a half inch to an inch in size.

#### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (April 20): Seventy-eight percent of overwintered larvae pupated on April 20 and the first spring-brood moth emerged on the 15th.

Virginia. W. J. Schoene (April 20): Adult peach moths were taken at Crozet on April 16, and at Hollins and Blacksburg on April 20.

Georgia and Alabama. O. I. Snapp (April 16): The first twig injury of the season was observed at Fort Valley today. The oldest larvae in these twigs were about 3 days old. Eggs began to hatch April 13, which is about the usual time. Larvae at least one-half grown were reported on April 12 at Prattville, Ala., which is in about the same latitude as Fort Valley. The dates of first twig injury at Fort Valley other years are as follows: April 10, 1925; April 20, 1926; April 1, 1927; April 25, 1928; April 4, 1929; April 29, 1930; April 22, 1931; May 17, 1932; April 20, 1933; April 24, 1934; April 3, 1935.

C. H. Alden (April 21): First moth caught in bait pots at Cornelia, Ga., on April 15. Very few have emerged so far. No egg deposition.

#### PEACH TWIG BORER (Anarsia lineatella Zell.)

Utah. C. J. Sorenson (April 24): Peach twig borers are feeding in blossoms and leaf buds of peaches in Davis County.

CLOVER MITE (Bryobia praetiosa Koch)

Utah. C. J. Sorenson (April 24): Brown mites are active on unsprayed peach trees in Davis County.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (April): The pear psylla is present and laying eggs in normal abundance in the Hudson River Valley, but in the Lake district the weather has been unfavorable for egg laying.

PEAR MIDGE (Contarinia pyrivora Riley)

New York. N. Y. State Coll. Agr. News Letter (April): The first flies were observed on April 23 in Columbia and Dutchess Counties.

PEAR THRIPS (Taeniothrips inconsequens Uzel)

New York. N. Y. State Coll. Agr. News Letter (April): Pear thrips were first observed from March 29 to 31 in the Hudson River Valley. Since that time the increase was slight and no definite swarming had been noted by the middle of the month.

CHERRY

BLACK CHERRY APHID (Myzus cerasi Fab.)

New York. N. Y. State Coll. Agr. News Letter (April): The black cherry aphid began hatching in the Hudson River Valley the last of March. In the Lake district in Orleans and Monroe Counties aphids were first observed on the buds the third week of April.

Montana. A. L. Strand (April 22): The black cherry aphid is present in very reduced numbers this spring in the Flathead sweet cherry district. Evidently extremely low temperatures in October of last year had considerable effect in causing this reduction.

CHERRY CASE BEARER (Coleophora pruniella Clem.)

Wisconsin. C. L. Fluke (April 20): The severely cold weather of the past winter apparently did not injure many of the wintering cases. Twigs brought into the laboratory from Door County showed almost as many live cases as in former years.



PLUM

RUSTY PLUM APHID (Hysteroneura setariae Thos.)

Mississippi. C. Lyle (April 24): Specimens of the rusty plum aphid with the report that they were seriously damaging plum trees were received from Belzoni on April 17.

RASPBERRY

FOUR-SPOTTED TREE CRICKET (Oecanthus nigricornis quadripunctatus Beut.)

Idaho. C. Wakeland (April 21): The four-spotted tree cricket is causing serious damage to red raspberry canes at Lewiston and growers are preparing to spray.

GRAPE

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

California. H. C. Donohoe and G. H. Kaloostian (April 13): The grape leaf folder has been reported as doing serious damage to several varieties of grapes in the Kings River bottoms near Sanger for the past 4 years. Examinations of soil in a planting on April 11 indicated a high population of overwintering pupae. Adult emergence is just commencing.

GRAPE ROOT BORER (Paranthrene polistiformis Harr.)

Kentucky. W. A. Price (April 25): The grapevine root borer has damaged many vines in a vineyard at Lexington. On removing the vines on April 20, larvae in both the first and second year growth were found.

A WEEVIL (Glyptoscelis squamulata Crotch)

California. H. C. Donohoe (April 13): Adults are abundant, feeding on new shoots of Sultana grapevines in the Kings River bottoms near Sanger. On several other varieties in the immediate vicinity the beetles were scarce.

GOOSEBERRY

IMPORTED CURRANT WORM (Pteronidea ribesii Scop.)

Iowa. H. E. Jaques (April 24): Eggs of the imported currant worm are showing up on gooseberries in the southeastern part of the State.

PECAN

PECAN NUT WORM (Acrobasis caryae Grote)

Florida. G. F. Moznette and S. O. Hill (April 21): The larva of this insect

formerly known as the pecan nut casebearer, was found to be working in the shoots of pecan on April 21. Indications are that it will be about as abundant in the Monticello pecan section as last season, when from 10 to 30 percent of the nuts were destroyed during May and June. From present indications, the pecan crop will be exceedingly light in the Monticello section this year, and the damage which this insect will cause will no doubt appear considerable to the growers.

Texas. C. B. Nickels (April 8): An examination of several hundred pecan trees near Crystal City and San Antonio on March 31, April 1 and 2, indicated an extremely severe infestation of the pecan nut case bearer.

#### PECAN LEAF CASE BEARER (Acrobasis juglandis LeB.)

Georgia and Florida. G. F. Moznette and S. O. Hill (April 13): The larvae of the pecan leaf case bearer were found to be infesting the buds and new growth in large numbers at Albany, Ga., and Monticello, Fla., and causing considerable damage.

#### HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Georgia. G. F. Moznette and S. O. Hill (April): The moths of the hickory shuck worm have been emerging in considerable numbers from the overwintering stage within the shucks on the ground at Albany, but the emergence is subsiding somewhat since April 15.

#### APHIDS (Aphidae)

Georgia. T. L. Bissell (April 26): At Griffin adult stem mothers of black pecan aphid, Melanocallis caryaefoliae Davis, are common, few young. I see no leaf injury. Found one adult stem mother of the black margined aphid, Monellia costalis Fitch. As is usual at this time of year, adult stem mothers of black spotted aphid, Monellia nigropunctata Granovsky, and their young are abundant.

Texas. C. B. Nickels (April 25): The giant hickory aphid was unusually abundant on pecan and walnut in Texas during April. Reports were received that this insect was abundant near the following localities: Austin, Brady, Brownwood, Burnet, Gatesville, Georgetown, Lampasas, Lometa, San Antonio, and San Saba. On a small percentage of the trees all of the branches were nearly completely encircled by the giant hickory aphid; however, on a majority of the trees the insect was found in groups which extended approximately 6-12 inches lengthwise of the twigs. To obtain information about this insect from one to six people called every day during the period April 5 to 25. At present hickory aphids are more abundant than at any other time during this month.

A SPITTLE BUG (Clastoptera obtusa Say)

Florida. G. F. Moznette and S. O. Hill (April 21): This spittle bug is appearing in considerable numbers on the new growth of the pecan in the Monticello section.

CITRUS

FRUIT FLIES (Anastrepha spp.)

Texas. P. A. Hoidale (April 2): Traps continue to catch adults both in Texas groves and in the Mexican brush. During the last 2 weeks 5 adult A. ludens Loew were taken in Brooks County, and 21 in the lower Rio Grande Valley, while 10 were taken in the brush south of Reynosa and Matamoros, Mexico. In all these locations 52 A. sp. "Y", 53 A. pallens Coq., and 16 Toxotrypana curvicauda Gerst. were also trapped. (April 16): During the past two weeks trapping operations have been carried on as usual and during this period 15 A. ludens were taken in the lower Rio Grande Valley and 7 in northern Hidalgo and Starr Counties. Six of these flies were taken in the brush.

GREEN CITRUS APHID (Aphis spiraeicola Patch)

Florida. J. R. Watson (April 23): The green citrus aphid is quite scarce for this time of year as the spring flush of growth of citrus has hardened up and there is very little food for it.

H. T. Fernald (April 22): Citrus aphids scarce at Orlando.

CITRUS WHITEFLY (Dialeurodes citri Riley & How.)

Florida. H. T. Fernald (April 22): Citrus whitefly rather less in evidence than usual at Orlando, although moderately abundant. Adult maximum abundance occurred about March 30.

Mississippi. C. Lyle (April 24): The citrus whitefly is reported rather abundant on its usual hosts by inspectors in the southern half of the State during the past 2 weeks.

FLOWER THRIPS (Frankliniella tritici Fitch)

Arizona. C. D. Lebert (April 23): The flower thrips has been observed to be quite abundant on citrus during the past month at Phoenix, and considerable injury has occurred on roses. No citrus injury noticeable as yet.

SIX-SPOTTED MITE (Tetranychus sexmaculatus Riley)

Florida. J. R. Watson (April 23): The weather, having turned dry during the last 2 weeks, has given marked impetus to the six-spotted mite, and is responsible for the heaviest infestation we have seen in several years. This mite is particularly injurious to grapefruit.



H. Spencer (April 28): The six-spotted mite is quite prevalent in the orange and grapefruit trees near Orlando. Many of the leaves show the characteristic yellow, distorted spots, and in some few instances the trees have been defoliated.

CITRUS RED MITE (Paratetranychus citri McG.)

Florida. J. R. Watson (April 23): Some purple mites were found on citrus, mixed with the six-spotted mites.

California. H. J. Ryan (April 22): Infestations were on the increase in Los Angeles County in March, and considerable damage is being caused in citrus groves.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (April 23): The weather having turned dry during the last 2 weeks, has given marked impetus to rust mites on citrus.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Georgia. T. L. Bissell (April 18): There is an error in the April 1 Bulletin (p. 40) in my note concerning this insect. The pupae found on March 28 at Clarkston were all alive and not "mostly dead." I meant to say the turnips were dead from cold. Pupae collected and caged that day have all transformed to adults during the period April 1-15. Material from other sources is now in the pupal state. No further scouting has been done.

Alabama. J. M. Robinson (April 21): Adults emerged in large numbers the last week in March and first 10 days in April. They came out in gardens and fields where turnips and winter greens were growing last winter, causing considerable damage to tomato plants set near the gardens.

Mississippi. C. Lyle (April 24): The vegetable weevil is apparently more abundant than last year. Heavy injury to gardens and truck crops in the Crystal Springs-Hazlehurst trucking section has been reported.

Louisiana. B. A. Osterberger (April 23): Vegetable weevils have been active in many parts of the State, attacking principally vegetable and truck crops.

Texas. F. L. Thomas (April 22): Reported from Gillespie County on April 2.

California. H. J. Ryan (April 22): The vegetable weevil was found this year as in 1935, generally distributed south and southeast of Los Angeles. Heavy larval damage occurred along the edge of a celery field at Lomita.

R. E. Campbell (April 15): To the list of localities where the vegetable weevil is found in California, which we forwarded to you in June 1935, the following may be added: Chula Vista, Bonita, Spring Valley, East San Diego, and National City, in San Diego County; and East Santa Barbara, Montecito, and West Santa Barbara, in Santa Barbara County. (April 23): Citrus seedlings in a nursery at East Whittier, Los Angeles County, are being defoliated by the adults. Larvae bred on mustard cover crop, which has been plowed under. The adults are emerging in great numbers and, finding little food, are attacking the citrus seedlings. They are abundant in nearby citrus orchards and feeding on oranges which drop to the ground, 17 beetles being collected on one orange.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

South Carolina. F. Sherman (April 20): Spotted melon beetles are out in numbers on various plants. One report indicated abundance on young cucumber plants.

Georgia. T. L. Bissell (April 23): Cucumber beetles were very abundant on peach trees at Experiment the latter part of March, when they were in blossom, averaging about eight to the tree. Diggings have been made for larvae in legumes and grass for a month but none were found until April 20, when a second-instar larva was taken from roots of vetch, and the next day a first-instar larva was taken on corn. Beetles have laid eggs in the insectary since February 29.

STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

South Carolina. F. Sherman (April 20): D. Dunavan reports having seen active specimens of the striped melon beetle.

Georgia. T. L. Bissell (April 20): One striped cucumber beetle found on peach tree today at Experiment. One found at light on April 17, the first of the season.

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Virginia. H. G. Walker (April 21): Adults of the seed corn maggot are rather abundant in the field near Norfolk, but very little injury has been reported.

South Carolina. W. J. Reid, Jr. (April 14): The seed corn maggot caused serious injury to the germinating seed of experimental plantings of cucumbers near Charleston. The damage necessitated replanting the crops. The germinating seed of an experimental planting of sweet corn at the Truck Experiment Station, Charleston, was found to be infested, many of the seeds having been destroyed. The unusual degree of injury caused by the insect is attributed to the delayed germination of the seed resulting from cold, wet soil.



TARNISHED PLANT BUG (Lygus pratensis L.)

Colorado. S. C. McCampbell (April 27): The tarnished plant bug is causing severe injury to spinach, cabbage, and cauliflower around Pueblo and Canon City. In one instance the bugs were abundant on rhubarb.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Virginia. H. G. Walker (April 21): The Colorado potato beetle is rather abundant in many fields of potatoes at Norfolk where they have deposited quite a few eggs. No young larvae have been found to date.

South Carolina. F. Sherman (April 20): Potato beetle not yet seen. Early planted potatoes are now well up, some plants 6 inches high at Clemson.

Georgia. T. L. Bissell (April 19): On March 28 the first beetle from hibernation was found in a cage at Experiment over dead leaves and grass. On April 14 a few beetles were noticed on potatoes and on April 15 one egg mass was found.

Florida. J. R. Watson (April 23): The Colorado potato beetle was quite injurious in the northern part of Alachua County. Dusting was quite general.

Alabama. J. M. Robinson (April 21): The Colorado potato beetle is moderately abundant, requiring protective measures for the potatoes.

Mississippi. C. Lyle and assistants (April 24): The Colorado potato beetle is fairly abundant on tomatoes in the field in Copiah and Lincoln Counties. This beetle was first observed at Ocean Springs on April 4. It is reported to be abundant at Moss Point but unusually scarce at Poplarville.

Louisiana. B. A. Osterberger (April 23): Potato bug is numerous over the State. Many growers are dusting.

Texas. F. L. Thomas (April 22): On April 20 the Colorado potato beetle was causing considerable injury to large fields of potatoes in Wharton and Cameron Counties.

FLEA BEETLES (Epitrix spp.)

Virginia. H. G. Walker (April 21): The tobacco flea beetle (E. parvula Fab.) and the potato flea beetle (E. cucumeris Harr.) are present in the Norfolk district, but have not done much feeding on potatoes.



CORN EAR WORM (Heliothis obsoleta Fab.)

Utah. H. L. Blood (1936): The tomato fruit worm has been exceedingly abundant and troublesome for the past 2 years. This insect has been held responsible for a 10 percent reduction in tomato production, resulting in a loss of approximately \$404,000. This figure is not representative of the total loss suffered by the industry from the abundance of the worm. An increase in production costs, with a proportionate reduction in the net income of the processors, would not be reflected in the reduction in total value of the crop to the industry on a production basis and, consequently, such a loss would necessarily augment the production losses from the ravages of the insect. Under the Federal Food and Drugs Act, filthy or decayed products are prohibited, and tomato products containing worms or worm fragments come within this restriction. In order to comply with this requirement the processors have had to adopt a more careful sorting and trimming than had previously been employed. Meeting this requirement has added a cost estimated at \$85,000 and increased the loss to the State resulting from the fruit worm to approximately \$495,000, or about 20 percent of the total loss to the industry in Utah from diseases and other causes.

California. J. C. Elmore (April 2-7): A survey of tomato fields at El Centro, Brawley, Westmoreland, and Niland failed to locate any corn ear worms on tomato. Near Santa Ana on April 9, seven moths were collected at lights between 8 and 9 p.m. They laid eggs under outdoor conditions at Alhambra.

BEEF ARMYWORM(Laphygma exigua Hbn.)

California. J. C. Elmore (April 2): Beet armyworm is common on tomato vines near Niland, attacking foliage and fruit, but losses are not unusually heavy.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Virginia. H. G. Walker (April 21): The tomato pinworm was rather abundant late last summer in a greenhouse near Norfolk where late fall and early spring crops of tomatoes were being grown. As a result, a fall crop of tomatoes was not planted last year, and so far no evidence of pinworms has appeared in the spring crop, which was planted in January.

California. J. C. Elmore (April 7): Tomato fields which have survived the winter in the early tomato growing areas near Santa Ana, Orange County, are very heavily infested. There are hundreds of larvae per plant. New fields near the old ones are already heavily infested.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Ohio. N. F. Howard (April 9): Survival of the Mexican bean beetle at Columbus remains between 2 and 3 percent, as reported a month ago.

Mississippi. L. J. Goodgame (April 24): Mexican bean beetles found in the soil in Monroe County early in April. No beetles have yet been observed this season on beans.

BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. H. G. Walker (April 21): The bean leaf beetle is beginning to emerge from hibernation. Several beetles have been collected in bean fields at Norfolk, but very little feeding has occurred to date.

Mississippi. D. W. Grimes (April 24): Medium injury to beans at Durant and McAdams.

Texas. F. L. Thomas (April 22): J. N. Roney reports that in Wharton County on April 16 the bean leaf beetle had almost completely destroyed about 10 rows of string beans.

PEAS

PEA APHID (Illinoia pisi Kalt.)

Virginia. H. G. Walker (April 21): The pea aphid is from scarce to relatively abundant on alfalfa, but very scarce on peas in the vicinity of Norfolk.

Mississippi. C. Lyle (April 24): The pea aphid is reported as less abundant than usual on Austrian winter peas at Poplarville. Examination of pea fields in the Crystal Springs-Hazlehurst trucking section on April 4 failed to show any infestation.

California. R. E. Campbell (April 15): Most of the pea fields of Santa Clara County are moderately infested. Cold weather during the first part of April checked multiplication, but recent warm weather has caused a build-up which will undoubtedly be sufficient to cause injury before harvest time.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Virginia. H. G. Walker (April 21): Butterflies are moderately abundant at Norfolk. Eggs and small worms are present but very scarce.

South Carolina. F. Sherman (April 20): White cabbage butterflies have been in flight several weeks.

Georgia. T. L. Bissell (April 13): Cabbage at Experiment is lightly infested with small worms.

Florida. H. T. Fernald (April 22): Cabbage butterflies are scarcer than usual at this time of year at Orlando.



Mississippi. C. Lyle and assistants (April 24): The imported cabbage worm is very abundant at Aberdeen, Poplarville, and Moss Point, and slight injury reported in Lincoln and Copiah Counties.

Ohio. B. J. Landis (April 21): The first adult of the imported cabbage worm was observed in the field today.

#### CABBAGE LOOPER (Autographa brassicae Riley)

Louisiana. B. A. Osterberger (April 23): Cabbage loopers are more numerous and eggs are easily found. So far no Trichogramma parasites have been found in the eggs collected.

California. J. C. Elmore (April 2): A looper, either A. brassicae or A. californica Speyer, was common on tomato vines near Niland, attacking fruit and foliage.

#### CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Walker (April 21): The cabbage aphid is very scarce at Norfolk except in a few fields where the aphids were brought in with the plants from the South.

South Carolina. J. A. Berly (April 20): The cabbage aphid is prevalent on cabbage in gardens at Clemson.

Georgia. T. L. Bissell (April 18): Aphids are scarce on cabbage at Experiment.

Mississippi. C. Lyle and assistants (April 24): The cabbage aphid is apparently more abundant than usual in most parts of Mississippi and has caused very heavy damage in the Crystal Springs-Hazlehurst trucking section. It is reported that hundreds of acres were plowed up on account of damage. Only medium injury is reported on home-grown plants, the heaviest loss occurring on imported plants. A heavy infestation was noted on collards at Poplarville late in March.

#### HARLEQUIN BUG (Murgantia histrionica Hahn)

Georgia. T. L. Bissell (April 18): Comparatively few harlequin bugs have been seen this year on collard at Experiment.

Alabama. J. M. Robinson (April 21): The harlequin cabbage bug continues to increase in abundance, coming from its hibernation places. These bugs are attacking turnips and other greens in gardens.

Mississippi. C. Lyle (April 24): The harlequin cabbage bug has been noted by all inspectors but was reported to be numerous only at Poplarville. The county agent at Hattiesburg reported serious damage to cabbage and turnips on April 4.



## ASPARAGUS

### ASPARAGUS BEETLE (Crioceris asparagi L.)

Washington. M. C. Lane and E. W. Jones (April 16): This beetle was found in destructive numbers in several asparagus fields in the Walla Walla Valley. Last year only a few scattered infestations were reported. It is evidently gaining a foothold in the rapidly expanding asparagus districts of the Walla Walla Valley.

California. R. E. Campbell (April 15): Several asparagus fields in Los Angeles County are badly infested with asparagus beetles. Many new stalks are ruined by deposits of eggs.

## SQUASH

### SQUASH BUG (Anasa tristis DeG.)

Idaho. C. Wakeland (April 21): The squash bug has spread throughout southwestern Idaho and has extended its range eastward as far as King Hill. Another infestation occurs in Franklin County, in the southeastern part of the State.

## SPINACH

### GREEN PEACH APHID (Myzus persicae Sulz.)

Virginia. H. G. Walker (April 21): The spinach aphid (M. persicae) has been very scarce or entirely absent from Norfolk since the fungous disease killed off the heavy infestation last fall.

## BEETS

### BEET LEAFHOPPER (Eutettix tenellus Baker)

Texas. D. W. De Long and R. K. Fletcher (April 22): A brief survey to determine the presence, abundance, and distribution of the beet leafhopper in the Winter Garden section of Texas was made from April 14 to 18. Beet leafhopper was found in Zavala, Dimmit, Maverick, and Webb Counties. Spinach was found to be badly diseased. Curly top reported.

California. S. Lockwood (April 30): Inspection of a sugar beet field in Fresno County on April 27 showed the sugar beet leafhopper to be especially numerous in the field. Counts showed approximately five leafhoppers per plant.

## APHIDS (Aphidae)

New Mexico. R. E. McDonald (April 20): J. N. Crisler writes that aphids are doing serious damage to sugar beets in the lower Mesilla Valley. Some of the beets may have to be plowed up as a result of injury by this insect.

## TOBACCO

### TOBACCO FLEA BEETLE (Epitrix parvula Fab.)

North Carolina. C. H. Brannon (April 27): Many tobacco beds have been severely damaged this year. Practically all beds show evidence of some feeding.

### SLUGS (Mollusca)

North Carolina. C. H. Brannon (April 15): Slugs have been very destructive to tobacco beds in Robeson and Columbus Counties.

## C O T T O N I N S E C T S

### BOLL WEEVIL (Anthonomus grandis Boh.)

Oklahoma. C. F. Stiles (April 22): Up to and including April 16 there had not been any boll weevil activity in the hibernation cages at Eufaula, where we have 25,550 weevils in hibernation. So far very little cotton has been planted.

### PINK BOLLWORM (Pectinophora gossypiella Saund.)

Puerto Rico. L. C. Fife (April 14): At Aguadilla about 50 plants of soca cotton bearing many mature green bolls were found growing in a field of planta cotton that was just beginning to bloom. Of 93 mature green bolls examined, 50, or 55.6 percent, were found to be infested with pink bollworm larvae in all stages of development. Two cotton fields planted December 15, 1935, at Isabela were heavily infested. Of 87 mature green bolls examined from one of these fields, 47, or 54 percent, were infested. In the other field 30 bolls were examined and 15, or 50 percent, were infested. Blooms were also heavily infested in this field. Cotton was planted in these and adjacent fields last year. The old cotton plants of the 1935 crop were destroyed only a week or so before the planting of the 1936 crop. In some adjacent fields the old plants were cut down and piled, but had not been burned. An examination of the seed cotton in these fields showed that it was heavily infested with the pink bollworm (long-cycle larvae). These facts clearly explain why the infestation is so high in these fields. Another field examined at Isabela showed an infestation of 10 percent. The heaviest infestation on the northern coast during 1935 occurred at Camuy; however, no cotton plantings in this locality are bearing mature green bolls at present. Two hundred mature green bolls were examined from two fields at Quebradillas on April 6. The infestations in these fields were 2 and 4 percent, respectively. Only one small experimental plot of Meade cotton was grown at Arecibo last year. During the present season, possibly 700 acres are grown in this locality. Two hundred mature green bolls from two fields planted December 15, 1935, were examined but neither field was found infested. At Hatillo, mature green bolls from two different fields were examined. Only one of these fields was found to be infested.



COTTON APHID (Aphis gossypii Glov.)

Arizona. T. P. Cassidy and T. C. Barber (April 18): In the vicinity of Buckeye in the Salt River Valley cotton lice are very prevalent on the foliage of sprouting stubble cotton.

Puerto Rico. L. C. Fife (April 14): The cotton aphid was found in most of the plantings on the northern coast, but no serious damage was observed.

FIELD CRICKET (Gryllus assimilis Fab.)

Mexico. C. S. Rude (April 14): Field crickets continued to be a serious pest in the cotton fields of the Laguna district of Mexico. In some places the cotton is recovering from the cricket damage but in others replanting will be necessary. This is a serious situation, as there is not enough seed in the Laguna for replanting and, with exchange and financial conditions as they are, it will be very difficult to import the cotton seed.

COTTON BLISTER MITE (Eriophyes gossypii Eks.)

Puerto Rico. L. C. Fife (April 14): Young cotton plants 12 inches high were found to be heavily infested with the West Indian blister mite (E. gossypii) in one field at Isabela on April 6. Many of the fruiting branches on these plants have been destroyed. This infestation originated from infested new growth on old cotton plants of the 1935 crop that had not been destroyed in an adjacent field.

F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

CANKERWORMS (Geometridae)

Connecticut. B. H. Walden (April 24): Eggs of Alsophila pometaria Harr. are abundant in New Haven County. No indications of hatching.

New York. N. Y. State Coll. Agr. News Letter (April 13): Several cankerworm egg masses have been observed in Greene County.

New Jersey. H. W. Allen (April 20): A considerable number of egg clusters, apparently of fall cankerworms, have been noted in the vicinity of Moorestown. As this insect was not present in destructive numbers in this vicinity last year, the presence of considerable numbers of egg clusters may indicate the probability of an appreciable infestation during the coming season.

Michigan. R. Hutson (April 20): Eggs of cankerworms are abundant about Lansing, Grand Rapids, and Owosso.



FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Mississippi. C. Lyle (April 24): A heavy infestation of the forest tent caterpillar is occurring again this year in the extreme southern part of the State. Sweetgum and oak trees, especially, are being defoliated in Pearl River, Hancock, Harrison, and Marion Counties. Many people are alarmed at the enormous numbers of the insect.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

New Jersey. H. W. Allen (April 20): There is somewhat heavier infestation of bagworm than usual in evidence in southern New Jersey. Many bags are present in thickets of locust, on young sycamores in street plantings, and occasionally on ornamental evergreens. A considerable portion of the female bags contain no healthy eggs, so the infestation of caterpillars may not be heavier than usual.

Louisiana. B. A. Osterberger (April 20): A few very small bagworms were received from Covington.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Pennsylvania. E. P. Felt (April 24): Adults were found wintering in large numbers in a building in the Philadelphia district.

Idaho. C. Wakeland (April 21): The elm leaf beetle has spread throughout southwestern Idaho and reached eastward as far as Gooding. Northward in the State it is known to occur in Moscow.

California. C. S. Morley (April 3): Elm leaf beetles have been found feeding on elm leaves in several places within the city limits of Bakersfield during the last 2 weeks. Elm trees were not sprayed last year, which resulted in many overwintering beetles that threaten the foliage of elm trees this year.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Illinois. W. P. Flint (April 20): The cold weather of the winter apparently had only very little effect on the European elm scale. Recent examinations of this insect have failed to show more than the normal winter mortality.

Idaho. C. Wakeland (April 21): European elm scale was heavily killed last winter by temperatures in northern Idaho.

EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Oklahoma. F. A. Fenton (April 20): The European fruit Lecanium has proved to be far more destructive this year than last. Most of the damage appears to be on elm trees, particularly the American elm. At present the females have nearly completed egg deposition.

## HEMLOCK

### A NEEDLE MINER (Recurvaria apicitripunctella Clem.)

Connecticut. G. H. Plumb (April 13): The insect seems to be fairly abundant on hemlock at Hamden. Larvae of both brown and green colors were found, and pupae were found 3 days later. They eat only the under surface of some needles and mine in others.

## LARCH

### LARCH CASE BEARER (Coleophora laricella Hbn.)

Vermont. H. L. Bailey (April 25): Cases of the larch case bearer found moderately abundant on trees in Glover, Orleans County, and very abundant in Cabot, Washington County, on April 23.

Connecticut. E. P. Felt (April 24): Larch case bearers have commenced feeding on the young needles and are locally abundant.

## LOCUST

### A BORER (Agrilus difficilis Gory)

Colorado. J. A. Beal (April 7): The honeylocust (Gleditsia triacanthos), a tree widely used in early windbreak plantings and in the new plantings because of its supposed immunity to insect injury, has, during the past summer, been heavily attacked and killed in many plantings.

## MAPLE

### TERRAPIN SCALE (Lecanium nigrofasciatum Perg.)

Connecticut and Pennsylvania. E. P. Felt (April 24): The black banded scale was quite abundant on maple in the Philadelphia district and also at Bridgeport, Conn.

## OAK

### A BORER (Aegeria mellinipennis Bdv.)

California. H. J. Ryan (April 22): This borer was found to be causing considerable damage to two large California live oaks on a residential property in San Marino.

### AN OAK SCALE (Lecanium quercifex Fitch)

Mississippi. C. Lyle (April 24): Heavy infestations of the oak lecanium were reported during the month from Utica, Meehan, Poplarville, and Union.

PINE

A TUSSOCK MOTH (Halisidota ingens Hy. Edw.)

Arizona. M. W. Blackman (March 26): These caterpillars are apparently doing serious damage to Ponderosa pine in the Apache National Forest. The conditions as described seem rather alarming. (Determined by C. Heinrich.)

WHITE-PINE WEEVIL (Pissodes strobi Peck)

Pennsylvania. E. P. Felt (April 24): Some injury to Austrian pine occurred in the Philadelphia area, though in New England this insect shows a marked preference for white pine.

A MIDGE (Diplosis inopis O. S.)

Connecticut. G. H. Plumb (April 20): A light-to-moderate infestation has been observed on Scotch pine in New Hartford. Where the larvae were working near the tips of the twigs, the bud clusters appeared to be affected. In most cases the lesions were formed about the base of a needle, although this was not always true.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Connecticut. W. E. Britton (April 24): Specimens received from Bristol and Wethersfield, where they were taken on Mugho pine.

Nebraska. M. H. Swenk (April 8): On April 8 some spruce trees in Sioux County were reported to be infested with the pine leaf scale.

WILLOW

BEAKED WILLOW GALL (Phytophaga rigida O.S.)

New Jersey. E. P. Felt (April 24): Reported as somewhat abundant on willows at Palisades Park.

I N S E C T S   A F F E C T I N G   G R E E N H O U S E  
A N D   O R N A M E N T A L   P L A N T S

CUBAN-LAUREL THRIPS (Gynaikothrips uzeli Zimm.)

Florida. J. R. Watson (April 23): Complaints were received of the depredations of the Cuban-laurel thrips from Sarasota and Babson Park. This is a very serious pest of Ficus nitida and F. religiosa, making the growing of these ornamentals almost impossible. Because the thrips curls up the young leaves very tightly it is impossible to get at it with an effective spray.



OYSTER -SHELL SCALE (Lepidosaphes ulmi L.)

District of Columbia. W. Middleton (April 2): Oyster-shell scale collected on elm trees in Washington. (Identified by H. Morrison.)

Indiana. J. J. Davis (April 26): Apparently the winter had little harmful effect on the oyster-shell scale.

Idaho. C. Wakeland (April 21): Oyster-shell scale was heavily killed by temperature of the last winter in northern Idaho.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. C. Lyle (April 24): On April 17 the county agent of Hattiesburg sent specimens of cottony cushion scale which, he stated, was very abundant on hedges in that city. This insect also occurs on some properties in Laurel. Ladybeetles are being distributed as rapidly as possible.

AZALEA

AZALEA SCALE (Eriococcus azaleae Comst.)

Mississippi. C. Lyle (April 24): Infestations of the azalea scale have been found during the past month at Pascagoula and Meridian. In both cases the infestations were traced to infested plants from a nursery in Mobile. Every effort is being made to clean up the infestations and prevent the spread.

DOGWOOD

DOGWOOD CLUB GALL (Lasioptera clavula Beutm.)

Connecticut. E. P. Felt (April 24): The dogwood club gall was found to be somewhat abundant on newly transplanted flowering dogwood.

JUNIPER

JUNIPER WEBWORM (Dichomeris marginellus Fab.)

Connecticut. E. P. Felt (April 24): The juniper webworm was somewhat abundant on Irish juniper at New Canaan.

LILAC

WHITE PEACH SCALE (Aulacaspis pentagona Targ.)

Connecticut and New York. E. P. Felt (April 24): White peach scale was found in some numbers on lilac at Darien, Conn., and Huntington, Long Island, N

ROSE

APHIDS (Aphiidae)

Texas. R. E. McDonald (April 20): Aphids are reported as doing considerable damage to roses in the El Paso and Mesilla Valleys.

I N S E C T S   A T T A C K I N G   M A N   A N D

D O M E S T I C   A N I M A L S

MAN

HUMAN FLEA (Pulex irritans L.)

Indiana and Missouri. E. C. Cushing (April 25): Reports received from several localities in Indiana and Missouri indicate that the human flea is beginning to appear and has already become abundant enough to cause considerable annoyance in dwellings.

BROWN SALT-MARSH MOSQUITO (Aedes cantator Coq.)

Delaware. L. A. Stearns (April 15): Larvae and pupae of this species are abundant in water holes on salt marsh near Odessa.

CLUSTER FLY (Pollenia rudis Fab.)

Ohio. N. F. Howard (April 21): Very abundant in a house at Worthington during February and March.

Indiana. J. J. Davis (April 26): The cluster, or attic, fly was frequently reported from the northern half of the State during March and the early part of April, as being very annoying in homes.

Michigan. Ray Hutson (April 20): The cluster fly has been reported from Oxford, Delta, Dimondale, and Charlotte, as causing annoyance in houses.

Wisconsin. C. L. Fluke (April 20): There is practically no insect activity except appearances of large numbers of cluster flies.

TROPICAL RAT MITE (Liponyssus bacoti Hirst)

Texas. R. E. McDonald (April 11): Mites taken from a bedroom in San Antonio on April 6 have been identified as the tropical rat mite.

CATTLE

TRUE SCREW WORM (Cochliomyia americana C. & P.)

Texas. E. C. Cushing (April 25): A survey of Jackson, Matagorda, and Brazoria Counties on April 2, by W. J. Spicer, shows that screw worms have not yet become active in this section of Texas this season. Most of the infestations in these three counties this season have been due to Phormia spp.

CATTLE GRUBS (Hypoderma spp.)

Illinois. E. C. Cushing (April 25): A scarcity of ox warble grubs was reported in the vicinity of Galesburg.

Minnesota and Iowa. E. C. Cushing (April 25): Surveys made by R. W. Wells and H. O. Schroeder on April 9, 10, and 11 in southeastern Minnesota and northeastern Iowa show infestations of animals to be very light in these areas. Several hundred head of cattle were examined and grubs were very rare in mature animals. The yearlings and 2-year-olds carried a few, the largest number found in a single animal being 10.

Kansas. H. R. Bryson (April 6): Cattle observed running from heel flies at Anthony and Wellington. Reported running in March by one stockman near Manhattan. In Bourbon County heel flies were seen chasing cattle about the middle of March.

A HORSEFLY (Tabanus sp.)

Texas. E. C. Cushing (April 25): W. J. Spicer, screw worm scout, reports on April 2 a rather severe outbreak of a small tabanid in the wooded section of Brazoria County. He states that cattle have been considerably annoyed by this pest since about March 15.

SHORT-NOSED CATTLE LOUSE (Haematopinus eurytarnus Nitz.)

Kansas. H. R. Bryson (April 7): The broad-nosed ox louse very abundant in many herds in Harper County. Many farmers are requesting remedies.

LONE STAR TICK (Amblyomma americanum L.)

Mississippi. H. Gladney (April 24): Specimens of this tick were collected in Jackson County. The ticks were so numerous in the yard that a person would soon be covered with them.

DEER

DEER BOTFLY (Cephenomyia pratti Hunter)

Utah. G. F. Knowlton and C. F. Smith (April 7): An examination of a series of dead and very much weakened deer in the vicinity of Logan showed most of those examined to be heavily infested with bot maggots in the gular pouches. Many deer are dying from starvation, probably aided by excessive infestation of parasites.

DOG

AMERICAN DOG TICK (Dermacentor variabilis Say)

Maryland and Virginia. E. C. Cushing (April 25): Several infestations of dogs by the American dog tick have been reported from points in Maryland and Virginia near Washington, D. C.



HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

- Connecticut. N. Turner and M. P. Zappe (April 24): Fifteen samples of winged termites (R. flavipes Kol.) were received for identification and 16 infested buildings inspected during the past month. A random sample survey of the State made during the winter showed that about 25 percent of all buildings inspected were infested, and about 30 percent of all wooden buildings showed the presence of termites. The buildings were of varying age and construction.
- New York. R. D. Glasgow (April 27): During the past 6 weeks we have identified termites swarming into the interior of houses at Albany, Schenectady, and Mount Vernon.
- Pennsylvania. R. M. Baker (April 21): Many reports of termite damage are coming in from scattered localities throughout most of the State.
- Delaware. L. A. Stearns (April 3): Specimens of injury to house structure at Hockessin examined; termites present.
- Ohio. T. H. Parks (April 24): Swarming of termites did not occur until about the middle of April, about 3 weeks later than usual. Judging from the reduced number of calls for aid, compared with those received during the past 4 years, termites have suffered from severe winter temperatures, along with many other insects.
- Indiana. J. J. Davis (April 26): The usual large numbers of inquiries about termites have been received. Swarming forms first made their appearance in January and migrations are still being reported.
- Illinois. W. P. Flint (April 20): Swarms have been appearing at many points in central Illinois during the last 3 weeks.
- Kentucky. W. Price (April 25): Termites, as usual, are the subject of many inquiries this spring. The first swarms were noticed in Lexington on March 2.
- Nebraska. M. H. Swenk (April 17): On March 26 a report was received of an infestation of R. tibialis Bks. around a Douglas County house, and on April 17 a report of them about the roots of trees near the foundation of a Gage County house.
- Kansas. H. R. Bryson (April 6): The usual numbers of inquiries about control of termites have been received, also reports of injury from Wellington, Manhattan, and other localities.
- Oklahoma. C. F. Stiles (April 22): Numerous flights of the sexed forms of termites have been observed in Payne, Ottawa, Haskell, Jefferson, and Pontotoc Counties.

ANTS (Formicidae)

New York. R. D. Glasgow (April 27): During the past 6 weeks we have identified carpenter ants swarming into houses at Millbrook, Loudonville Schenectady, and Albany.

Nebraska. M. H. Swenk (April 20): Reports of the presence of the basement ant (Lasius interjectus Mayr) around the foundations of houses in Douglas County were received during the period March 21 to April 20.

Oklahoma. F. A. Fenton (April 20): A number of inquiries have been received on control of household ants.

Mississippi. C. Lyle (April 24): Fire ants (Solenopsis xyloni McCook) have caused trouble in several places during the month. Inspector J. E. Lee reports several complaints of damage to clothes by this ant.

Utah. G. F. Knowlton (April 11): Ants are very troublesome in a home at Logan.

INDIAN-MEAL MOTH (Pledia interpunctella Hbn.)

California. H. C. Donohoe (April 6): Samples of stored 1935 crop, unprocessed seedless raisins from a storage at Kingsburg on February 25 averaged less than 175 larvae per ton. Similar samples in March 1935 before adult emergence averaged approximately 750 per ton.

DRIED FRUIT MOTH (Vitula serratilineella Rag.)

California. H. C. Donohoe (April 4): Unprocessed 1935 crop seedless raisins in storage at Kingsburg, were found slightly infested by larvae of the dried fruit moth during February. This is the first record of raisin infestation by this species in the San Joaquin Valley within the past 5 years. (April 27): Adults of the spring brood were more abundant than normally in a packing house in Napa on April 16. They were more than 20 times as abundant as those of the raisin moth, which is usually predominant.

RAISIN MOTH (Ephestia figulilella Greg.)

Arizona. H. C. Donohoe (April 4): Examination of miscellaneous larvae found infesting dates in the Experimental Date Garden at Tempe, collected by P. Simmons and D. F. Barnes in November 1935, yielded one raisin moth larva. This is the first record of this insect in the field in fruit in any area outside the State of California.

California. H. C. Donohoe (April 4): Studies of winter mortality in soil of raisin moth in the vicinity of a raisin storage at Kingsburg indicate that, at the start of spring pupation the last of March, mortality in continuously wet soil approximated 100 percent; in that only occasionally moistened, over 70 percent; and in dry, protected soil, no more than 30 percent. In the wet soil the increase in mortality was greatest during February, a period of excess rainfall. Over 150 samples of



unprocessed, stored, 1935-crop raisins collected at Kingsburg on February 25, yielded an average infestation of approximately 6,400 live raisin moth larvae per ton, these having survived the winter. A similar survey in March 1935 indicated a survival of 1,100 per ton.

A PYRALID (Ephesioides nigrella Hulst)

California. H. C. Donohoe (April 4): Samples of stored, unprocessed 1935-crop seedless raisins, collected at Kingsburg on February 25, contained light infestation by larvae. Although adults are frequently encountered about raisin storages early in the spring, this is the first definite natural host record for this species.

A PYRALID (Aphomia gularis Zell.)

California. H. C. Donohoe (April 27): Adults of the spring brood are emerging in prune storages in San Jose. They are more abundant than hitherto noted, and larval cocoons indicate an unusually high overwintering population in two of four packing plants visited on April 18.

PEA WEEVIL (Bruchus pisorum L.)

Idaho. C. Wakeland (April 21): At Moscow about one-third of the pea weevils in the most favorable positions overwintered successfully, according to a report by T. A. Brindley. Weevils in cages placed in Weather Bureau kiosks survived at Buhl, Twin Falls, Jerome, Rupert, Bliss, Pocatello, and Burley. In 14 other locations where cages were placed mortality in cages was complete.

TENEBRIONIDS (Blapstinus spp.)

California. D. F. Barnes and H. C. Donohoe (April 13): During the past winter the relatively rare beetle, B. sulcatus Lec., has been taken in large numbers beneath timbers, in the soil, and in raisin trash about a stack of stored 1935 raisins at Kingsburg.

D. F. Barnes and C. K. Fisher (April 29): Migration of adults of both sexes of B. rufipes Csy. by flight as well as by crawling was observed March 19 in Fresno County. This is the first observation we have made of the flight of this species. Females containing eggs were first collected on April 16.

DRIED FRUIT BEETLE (Carpophilus hemipterus L.)

California. D. F. Barnes (April 29): These beetles were taken throughout the winter in traps baited with fermenting dried peaches and set in a fig orchard in Fresno County. With the exception of about 1 month (December 16 to January 20) they were caught in traps in an area of grain land several miles from known supplies of food.



## INSECT CONDITIONS IN PUERTO RICO FOR THE SPRING OF 1936

By  
G. W. Wolcott

Since the middle of December, less than 2 inches of rain has fallen in Puerto Rico--much less than the normal rainfall for this time of year. The effect on certain insects has been very noticeable. The tobacco leaf miner (Gnorimoschema operculella Zell.) is destructively abundant in tobacco-growing districts that ordinarily escape injury entirely.

The effect of the weather on scale insects is also very noticeable, especially in citrus groves of such rugged contour that entomogenous fungi ordinarily can be depended on for commercial control. On some papaya trees that had been sprayed with miscible oils to control the West Indian peach scale (Aulacaspis pentagona Targ.), what ordinarily would be commercial control was obtained, but even a very small survival caused complete reinfestation 2 or 3 months later.

The yellow sugarcane aphid (Sipha flava Forbes), is generally supposed to be more or less effectively controlled by heavy rainfall. This winter and spring, when there has been practically no rainfall, the drought seems to have been effective in preventing even the beginning of field infestations, as none has been reported. An extended search in the Isabela district failed to disclose any.

The lima bean pod borer (Maruca testulalis Geyer) was destructively abundant in lima and snap beans at Yauco and Isabela last fall. In a lima bean plot at Isabela, from which samples have been harvested this late winter and spring, not a single caterpillar has been found. During the winter, a light infestation by Fundella cistipennis Dyar was noted. A normally heavy infestation by Etiella zinckenella Treit. developed this spring.

The onion thrips (Thrips tabaci Lind.) has entirely destroyed many onion plantings.

## THE MORE IMPORTANT ENTOMOLOGICAL RECORDS FOR MAY 1936

The periodical cicada began emerging shortly after the middle of May, with the peak of emergence in the Middle Atlantic States occurring during the last week of May. Reports indicate that this brood will reappear throughout the greater part of the territory infested.

Grasshoppers were reported as being extremely abundant in western, southwestern, and southern Iowa, and in parts of North Dakota, Nebraska, Oklahoma, Colorado, Utah, Wyoming, and California. Reports received too late to be included in the body of the bulletin indicate that young grasshoppers are more abundant in the vicinity of Manhattan, Kans., and in central Illinois than they have been for several years.

The Mormon cricket was appearing in outbreak numbers in several counties in Utah, eastern Nevada, Oregon, Montana, and Idaho.

Unusual numbers of cutworms were reported over a great part of the country, from Virginia and Georgia westward through the East Central States to Utah. In Utah, the pale western cutworm had occasioned a loss of over 7,500 acres of wheat. An unusual situation developed in Mississippi, where the variegated cutworm from ditch banks and adjoining alfalfa fields migrated into cotton, seriously damaging the stand. This species is also occurring in abundance in western Kansas.

Cool weather protracted the period of wireworm injury in Washington, where considerable damage was done to truck crops.

Heavy losses to evergreen seed beds occasioned by white grubs were reported from Wisconsin.

The common red spider emerged earlier than usual in the apple-growing sections of Washington, becoming so abundant as to require treatment.

Chinch bug infestation in the East Central States is very spotted. In some localities populations are heavy enough to produce considerable damage.

The spring brood of hessian fly was quite numerous in Indiana and Illinois. Considerable damage is reported from the western and southwestern parts of the latter State.

An unusually heavy infestation of corn ear worm in tomatoes was reported from Mississippi. Damage to corn silk was reported from California.

Sod webworms were very abundant in parts of Iowa and Missouri. Many cornfields were so badly infested as to require replanting.

Rather serious outbreaks of the sugarcane beetle were reported from limited areas in Tennessee and Mississippi.

Codling moth emergence reached its peak in Virginia, southern Illinois and Indiana by May 10. In Delaware, Pennsylvania, northern Indiana, and northern Illinois the peak of emergence was reached about the middle of the month. In Ohio and Missouri the peak was apparently somewhat later. In the Pacific Northwest emergence began on May 4 and was heavy during the period May 10-13.

Eastern tent caterpillar was reported quite generally from the southern New England and Middle Atlantic States westward to Tennessee.

Various fruit aphids were generally prevalent in the New England and Middle Atlantic States.

The peak of first-brood plum curculio larvae emerging from peach drops occurred in Georgia on May 4, 6 days later than last year. In the Fort Valley section the infestation was moderate. In Indiana, Illinois, and Missouri infestations were heavier than last year. The insect was also reported from Tennessee, Mississippi, and Minnesota.

Rather severe damage to pecans by the nut case bearer was reported from Mississippi and Louisiana.

The six-spotted mite has been more injurious to grapefruit in Florida than for many years. In some groves 50 percent of the leaves dropped.

Flea beetle injury to truck gardens was quite generally reported from the Middle Atlantic, East Central, and Mississippi Valley States. Severe injury by flea beetles was also reported from San Francisco Bay region of California.

The spotted cucumber beetle was observed attacking a variety of truck crops in the South Atlantic and lower Mississippi Valley States. Fields of watermelons and corn were being completely destroyed in parts of Mississippi and Texas.

Mexican bean beetles appear to be quite scarce from Virginia northward, possibly owing to the severe winter experienced in this part of the country. Beetles were starting to emerge in Georgia during the first week in the month but were still quite scarce in that State up to the third week.

The beet leafhopper was reported as having passed the winter successfully at Billings, Mont.



Boll weevil populations were generally reported as light throughout the Cotton Belt, with the exception of Texas, in which State there were more boll weevils than at this time of year during the past 3 years.

The first specimens of the cotton leaf worm were seen on May 5 near Port Tobacco, Tex.

Canker worms attacking both forest and shade trees, and occasionally apples, were very abundant throughout the New England, Middle Atlantic, and eastern part of the East Central States.

Forest tent caterpillars were generally abundant throughout New England southward to New Jersey. Heavy infestation is also reported from Minnesota and another from Mississippi and Louisiana. Considerable feeding by tent caterpillars is also reported from Utah and Washington.

Three cases of Rocky Mountain spotted fever have been reported from Maryland, in the vicinity of the District of Columbia.

During the month large numbers of infestations of household properties by termites were reported from the New England, Middle Atlantic, and East Central States westward to Nebraska and Oklahoma.

\*\*\*\*

We wish to take this opportunity to thank the collaborators for collecting June beetles for P. Luginbill. Further collections will be appreciated and if collections could be made weekly they would be more valuable.--J. A. Hyslop.

## GENERAL FEEDERS

### GRASSHOPPERS (Acrididae)

- Wisconsin. E. L. Chambers (May 20): Melanoplus mexicanus Sauss. was observed hatching in quite large numbers in spots located in light sand areas of northern Wisconsin, where there has been little or no rain this spring.
- Iowa. C. J. Drake (May 20): Grasshoppers are extremely abundant in western, southwestern, and southern Iowa. They are probably more abundant than they have been at any time during the past 20 years. The heaviest infestation is along the Missouri River and in the southwestern corner of the State. On Muscatine Island, in the Mississippi River, the hoppers have completely wiped out a number of truck patches. Fairly heavy infestations have been reported at Ottumwa and Waterloo.
- Missouri. L. Haseman (May 23): Grasshopper young appearing in swarms on dry ground. Apparently most of them are the common Carolina locust (Schistocerca americana Drury), although we have not closely checked nymphs for specific determination.
- North Dakota. F. G. Butcher (May 18): Recent field observations indicate that grasshopper infestations correspond closely to earlier forecasts. Some eggs are reported hatching in the southern counties. Predators have been responsible for the destruction of a small percentage of eggs, but otherwise practically all of the eggs are viable.
- Nebraska. O. S. Bare (May 19): Hatching of eggs is proceeding at a rapid rate and the young hoppers are appearing in great numbers along roadsides, pasture edges, ditch, cut banks, and sod fence rows.
- M. H. Swenk (May 20): On April 23 an inquiry was received from Webster County regarding the control of grasshoppers.
- Oklahoma. C. F. Stiles and F. A. Fenton (May 25): Grasshoppers have been reported as very numerous in pastures in northern Oklahoma. They are moving to alfalfa and row crops. (May 26): We visited Osage County and found four species of grasshoppers very numerous. Alfalfa is being severely damaged. M. femur-rubrum DeG. is the predominant species and M. differentialis Thos. is quite abundant.
- Colorado. G. M. List (May 22): Eggs have hatched well, and if the weather is favorable the infestation will be rather heavy for the egg population observed last fall. Poisoning is now under way in several counties.
- Utah. C. J. Sorenson (May 20): Grasshoppers have been hatching during the past 2 weeks at Kanosh and are very abundant.
- G. F. Knowlton (May 11): Grasshopper nymphs are causing moderate damage to dewberries at Orem, in Utah County, and to wheat near Lehi. Second- and third-instar nymphs are moderately abundant on the

foothills 6 miles west of Lehi. They are less abundant in most agricultural sections of northern Utah County. (May 19): Grasshopper nymphs are abundant in parts of the Little-Cedar Valley area and some injury to wheat and garden crops has been observed. Injury to dewberry foliage was observed at Granite and Pleasant Grove.

California. S. Lockwood (May 23): Undetermined species of grasshoppers are now causing damage in Butte, Sacramento, San Joaquin, and Solano Counties.

MORMON CRICKET (Anabrus simplex Hald.)

Utah. C. J. Sorenson (May 20): Mormon cricket outbreaks of third to sixth instars, have been noted as follows: Oak Creek mountains and range, east of Oak City, north of Holden, west of Scipio, also in a few fields near Oak City, Millard County; foothills, canyon, and nearby dry-farm fields southeast of Nephi, Juab County; foothills and adjoining dry-farm alfalfa and wheat fields northwest of Fountain Green, Sanpete County; Settlement Canyon and nearby fields southeast of Tooele, Tooele County.

CUTWORMS (Noctuidae)

Virginia. W. S. Hough (May 19): Climbing cutworms are very abundant in a number of orchards and have caused much damage to young apple trees by completely defoliating them. On bearing trees defoliation has not been complete but considerable damage has resulted from the outbreak. In several orchards cotton bands have been used successfully to keep the larvae from climbing the trees and in some instances poisoned-bran mash has been used in addition to banding the trees.

Georgia. O. I. Snapp (April 29): Cutworms are more abundant than usual at Fort Valley, especially in vegetable and flower gardens. They have cut down many little peach trees in our nursery. Precipitation during the spring has been considerably heavier than usual.

Ohio. T. H. Parks (May 25): Some cutworm injury is reported to corn in central Ohio though the damage is not severe. Late plowing of corn land prevented the farmers from fighting this pest in the usual way and enabled more of the worms to survive.

Indiana. J. J. Davis (May 23): Cutworms (Euxoa sp.) were reported on May 15 to be attacking apple at Bristol to the extent of at least \$1,000 damage. The bronzed cutworm (Nephelodes emmedonia Cram.) was reported from Aurora on May 19 as damaging bluegrass but not attacking any adjoining crops.

Michigan. R. Hutson (May 9): Cutworms have been reported as being particularly numerous at Big Rapids, South Haven, and Sodus. Adults of Agrotis c-nigrum L. have been very numerous at windows here in East Lansing. (May 20): Climbing cutworms are extremely abundant throughout the fruit district. Reports of extensive damage have been received from Hartford, Albion, Stockbridge, Charlotte, Grand Rapids, South Haven, Northville, St. Joseph, and Paw Paw. Additional infestations have been found at Hastings, Odessa, Mentha, Petoskey, and Lake City.



Wisconsin. E. L. Chambers (May 20): Cutworms are being reported quite generally throughout the northern part of the State as injuring garden crops.

Minnesota. A. G. Ruggles (May 22): Cutworms are moderately abundant.

Iowa. C. J. Drake (May 20): Cutworms have been doing a considerable amount of damage in garden truck areas near Des Moines.

Missouri. L. Haseman (May 23): Cutworms have been abundant during the month but seem less developed than usual for the season and few farmers have complained of them. They have injured corn and cotton next to fields of alfalfa recently cut in southeastern Missouri.

Nebraska. M. H. Swenk (May 20): From Garfield and Frontier Counties came inquiries on May 2 and 14, respectively, as to the control of cutworms in gardens.

O. S. Bare (May 19): Very little trouble has been reported from cutworms, but moths of the variegated cutworm (Lycophotia margaritosa saucia Hbn.) have been very plentiful.

Kansas. H. R. Bryson (May 14): The pale western cutworm (Porosagrotis orthogonia Morr.) is very abundant in many fields in Rawlins County as reported by E. G. Kelly, D. A. Wilbur, and H. H. Walkden. Twenty thousand acres badly injured in Rawlins County. Near Atwood several fields showed that 75 percent of the plants were destroyed. As many as 20 to 50 larvae per square yard were found. The county agent of Meade County reported local infestations in that county. It was also reported from Ellis, Cheyenne, Rush, Barton, and Logan Counties. Chorizagrotis auxiliaris Grote is plentiful in gardens in Rawlins County. Further reports of damage were received from Lincoln, Cheyenne, Riley, and Kearny Counties.

Mississippi. C. Lyle (May 23): The variegated cutworm (L. margaritosa saucia) has been unusually destructive in the Yazoo-Mississippi Delta for several weeks, especially in fields where winter cover crops were plowed under. This is undoubtedly the worst outbreak in several years. Cotton has suffered the heaviest damage, but fields of alfalfa have also been injured. Many complaints have been received from various sections of the Delta. On May 9 Agrotis ypsilon Rott. was found associated with the variegated cutworm on alfalfa and cotton at Greenwood, but in much fewer numbers.

Texas. K. P. Ewing & R. L. McGarr (May 1): Very little damage to cotton this year by cutworms in the vicinity of Port Lavaca has been reported, in contrast to widespread damage last year.

Utah. G. F. Knowlton (May 19): Cutworms have caused moderate injury to newly set tomato plants in various parts of northern Utah.

C. J. Sorenson (May 20): The pale western cutworm (Porosagrotis orthogonia Morr.) is abundant in Cedar Valley and vicinity in Utah County. Loss is estimated at 7,500 acres of fall-planted dry-farm wheat. The pest is also found in a few fields of irrigated wheat on Mapleton Bench and near Lehi, Utah County, and at Bluffdale, Salt Lake County. On Levan Ridge, Juab County, approximately 500 acres of fall-planted dry-farm wheat had been destroyed by May 15.

#### ARMYWORM (Cirphis unipuncta Haw.)

Virginia. H. G. Walker (May 25): Near Norfolk armyworms are very abundant in some small grain and alfalfa fields where they are migrating to other fields, being especially injurious to young corn.

Illinois. W. P. Flint (May 18): Light trap records at Urbana show a considerable flight of armyworms starting about the 19th of April and continuing in greater or lesser numbers, according to the temperature. Moths were flying in large numbers on the nights of May 8 to 12, inclusive.

#### SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

New York. L. E. Curtis (May 18): Seed corn maggot injury was observed on young onions grown from seed on muck near Savannah in Wayne County. The larvae were found working in the young developing bulb of the onion.

Iowa. C. J. Drake (May 20): The seed corn maggot is doing considerable damage here and there in the southern half of the State. Heavy infestations have been reported near Leon.

Missouri. L. Haseman (May 23): Seed corn maggots are doing their usual damage in wet, cold soil in northern Missouri.

#### WIREWORMS (Elateridae)

South Carolina. F. F. Bondy and C. F. Rainwater (May 2): A few wireworm larvae have been found feeding on cotton roots at Florence. Numerous adults were on a tanglefoot screen 2 days after it was put up in the center of a cotton field that was planted to corn last year.

Georgia. T. L. Bissell (May 21): Wireworms are rather abundant, attacking small corn and cotton at Experiment. Injury to the latter seems unimportant. A pupa, species unknown, was observed in soil yesterday.

Mississippi. D. W. Grimes (May 22): Wireworms are causing damage to corn and popcorn at Durant.

Missouri. L. Haseman (May 23): Only the usual number of complaints of wireworms.

Utah. G. F. Knowlton (May 19): Wireworms were moderately abundant in several wheat fields examined in the area northwest of Lehi.



Washington. H. P. Lanchester (May): Injury by Limonius canus Lec. and L. californicus Mann. to lettuce and spring-planted and transplanted onions has been general at Walla Walla. The continuance of cool nights has extended the period of intensive injury until some fields of these crops have been entirely destroyed, while most fields show considerable damage. The plantings of cabbage and corn are not so extensive, nevertheless the injury has been very serious. Some damage has also been noted in newly planted asparagus fields. The various species appeared more nearly at the same time than in the past several years and the period of their flight has been short, being practically over for this season.

K. E. Gibson (May): Plantings of sugar beets at Prosser were destroyed by wireworm (L. canus and L. californicus) feeding, while spring-planted wheat was severely damaged.

California. R. E. Campbell (May 1): Populations of L. californicus in many Orange County fields are much increased over last year, ranging in numerous counts from 3 to 75 per 10 feet of bait row (rows  $2\frac{1}{2}$  feet apart), and averaging 23. Last year's average at this time was 9. This increase was anticipated, owing to the large adult population last spring.

#### WHITE GRUBS (Phyllophaga spp.)

Vermont. H. L. Bailey (May 25): May beetles have been scarce up to this date but are more plentiful than last year. The first specimen was noted on May 5.

Delaware. D. MacCreary (May 17): The first large flight was observed on this date at Newark.

Maryland. E. P. Felt (May 23): June beetles, probably P. fusca Froel., are reported as very abundant and injurious on large oaks at Monkton.

Georgia. T. L. Bissell (May 5): May beetles are unusually abundant at Griffin feeding on leaves of oak, particularly red oak.

Kentucky. W. A. Price (May 26): May beetles have been very abundant in the bluegrass district of Kentucky. Many pin oaks and bur oaks have been defoliated. Elm, walnut, hackberry, and willow have also been attacked. Common species are P. hirticula Knoch, P. futilis Lec., P. tristis Fab., P. inversa Horn, P. fusca Froel., P. bipartita Horn, and P. horni Smith.

Wisconsin. E. L. Chambers (May 20): Heavy flights have been observed in Dane, Sauk, Portage, La Crosse, and Monroe Counties. All stages of white grubs are abundant in some of the northern nurseries in spots, and where no treatment was followed heavy losses have resulted to evergreen seed beds.

C. L. Fluke (May 20): A heavy flight of P. tristis Fab. began about the first week in May throughout southern and western counties, especially Jefferson, Lafayette, Iowa, Dane, Trempealeau, and Pepin.



Minnesota. A. G. Ruggles (May): W. G. Werner reports white grubs as very abundant in a lawn infestation at Kasson, in Dodge County.

Mississippi. C. Lyle and assistants (May 23): Injury to the foliage and buds of pecan trees has been observed in several sections of the State, especially near Grenada, Jackson, and Brookhaven.

Louisiana. W. C. Pierce (May 15): It has been difficult to collect specimens of Phyllophaga feeding on new growth of pecan trees in the vicinity of Shreveport since the first adult appearance on the night of March 24. Heavy infestations of the beetles are known to occur around the towns of De Ridder, Elizabeth, and Trout. In the De Ridder vicinity damage to pecans is confusing, owing to the combined attack of May beetles, the leaf case bearer (Acrobasis juglandis LeB.), and a lepidopterous larva of undetermined species. Most damage occurred to yard trees and outside rows of commercial plantings. Very few pecan trees were noticed around Trout, and these showed practically no injury. The beetles seem to prefer feeding on sweetgum and oak trees, which were almost defoliated. Conditions are about the same around all of these points of outbreak. The towns are located in cut-over pine land sections, with very little of the land in cultivation. The outbreak at Trout is widely separated from those at Elizabeth and De Ridder.

#### JAPANESE BEETLE (Popillia japonica Newm.)

United States. C. H. Hadley (April): In the monthly report for March 1936 a preliminary statement was made on larval mortality due to the cold weather in January and February. Additional surveys to determine the kill were made during the first 10 days of April. Findings in these bear out the previous statement that mortalities have been high in some areas in New Jersey, south of the latitude of Trenton, in the southeastern corner of Pennsylvania, in northern Delaware, and in northeastern Maryland. In much of this area mortalities above 50 percent are indicated. In areas where there was a heavy snow cover on the ground, as was the case in the northern half of New Jersey and in Pennsylvania, north and west of Philadelphia, mortalities are small, usually less than 5 percent.

#### ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Pennsylvania and New Jersey. L. B. Parker (April): Numerous and well-distributed diggings in areas previously heavily infested with these grubs indicate that the larval population is noticeably decreased this year. This fluctuation has been observed before as a local condition, but it seems to be prevalent throughout the Philadelphia area. Less extensive diggings point to a similar condition in Union County in northern New Jersey.

#### ASIATIC BEETLE (Anomala orientalis Waterh.)

Connecticut. W. E. Britton (May 22): Larvae have been identified from many lawns in New Haven and West Haven, thus considerably extending the areas infested by this insect.

ROSE CHAFER (Macrodactylus subspinosus Fab.)

New York. C. H. Hadley (May 1): Our attention was recently called to severe injury to several estates in the vicinity of Southampton, Long Island. The situation was investigated by Dr. J. L. King, of this station. Considerable injury to the turf was evident and examination showed that the injury was caused by larvae of the common rose chafer. Larval populations running in places as high as from 6 to 12 grubs per square foot were found.

Tennessee. G. M. Bentley (May 12): A very heavy infestation of the rose chafer occurred in an orchard at Fayetteville. There was a heavy infestation in the orchard last year. We have never had such a heavy outbreak of this insect before.

COMMON RED SPIDER (Tetranychus telarius L.)

Kentucky. W. A. Price (May 26): Red spider is very common in the bluegrass area.

Mississippi. C. Lyle (May 23): Red spiders are fairly abundant on arborvitae in southwestern Mississippi, according to Inspector N. D. Peets of Brookhaven. At this time they are also heavily infesting violets and junipers at State College, while correspondents report them on oak trees at New Albany, on Cedrus deodara at Ackerman, and on spinach at Lexington.

Arizona. C. D. Lebert (May 15): Considerable injury this season to arborvitae Italian cypress, and other evergreens in the Phoenix area. Several arborvitae and Italian cypresses have been killed and many severely injured.

Utah. G. F. Knowlton (May 6): Reports have been received that red spiders are beginning to injure raspberry foliage in parts of Utah and Box Elder Counties.

Washington. E. J. Newcomer (May 19): This red spider emerged rather early on account of a period of unusually warm weather from April 12 to 22, and it has been very abundant in apple trees.

C E R E A L   A N D   F O R A G E - C R O P   I N S E C T S

WHEAT

CHINCH BUG (Blissus leucopterus Say)

Indiana. C. M. Packard (May 19): Chinch bugs were scarce (from none to 2 per foot of drill row) in 8 out of 10 fields of young wheat and rye examined today in Tippecanoe County. In the other 2 fields spots near favorable hibernation quarters contained from 6 to 20 adult bugs per foot of drill row. A few eggs are now present but apparently none have hatched. No old bugs could be found in their hibernation quarters.

Illinois. W. P. Flint (May 18): A check-up on chinch bug conditions made



during the last 2 weeks shows a very spotted infestation over the southwestern, central, and northwestern parts of the State. Adult bugs were still flying in numbers during the week of May 10. Mating was general in the fields but no eggs had been found. A 400-mile check on wheat fields in the central part of the State, made on May 14-15, showed that approximately 25 percent of the wheat fields had sufficient bugs to cause moderate to heavy damage to adjoining corn, should the next 6 weeks be dry.

C. Benton (May 11-13): In the vicinity of Sterling gradual migration of the overwintered chinch bugs occurred during favorable periods throughout the week. Barley showed rather light but general infestations. Counts in several wheat, rye, and barley fields showed an average of one bug per foot of drill row. The heaviest infestation encountered was in a pastured rye field in which the counts averaged 6 bugs per foot of drill row. Mating is in progress, but no eggs or young have been found to date.

Iowa. C. J. Drake (May 20): The chinch bug situation is more encouraging than it has been for 3 years. Winter mortality ranged from 45 to 85 percent in some of the most heavily infested counties. The cool weather and late spring have greatly delayed spring migration to small-grain fields, and this has given the small grain a good start, so that it will be able to withstand a light to moderately heavy infestation. Surveys indicate that chinch bugs are most abundant in the southwestern and south-central counties and it is possible that moderate damage may occur here and there in these areas. In the extreme eastern and southeastern parts of the State winter mortality was so high that severe damage seems improbable; however, a number of scattered fields in this area contain a moderate number of bugs and there may be light commercial damage in some fields.

Missouri. L. Haseman (May 23): Chinch bugs are most abundant in a strip three or four counties wide extending across the State in a northeasterly direction from southwestern Missouri. Young were hatching on May 15 in west-central Missouri and a week earlier eggs were abundant at Columbia. Some fields are as severely infested with old bugs this year as in 1934.

Nebraska. M. H. Swenk (May 20): Chinch bugs were fairly abundant in barley fields in Nemaha and Richardson Counties during the week of May 11 to 16.

O. S. Baro (May 19): During the past week chinch bugs have appeared in considerable numbers in barley fields of Nemaha and Pawnee Counties.

Kansas. H. R. Bryson (May 19): Some counties in the southeastern corner of the State have an abundance of chinch bugs. Coffey, Bourbon, and Wilson Counties will no doubt need barriers at harvest time. Serious injury may result in some counties.

Mississippi. C. Lyle and assistants (May 23): Young corn is suffering severe injury by chinch bugs at Bay Springs, where many plants were reported to be falling over on April 30. This is also the case in Leflore County.



Bugs were light on oats at Morgan.

Texas. K. P. Ewing & R. L. McGarr (May 1): In April many acres of corn were destroyed in Calhoun County by chinch bugs, together with southern corn root worm (Diabrotica duodecimpunctata Fab.)

#### HESSIAN FLY (Phytophaga destructor Say)

Indiana. W. B. Noble (May 1): Observations in 16 wheat fields in Knox and Gibson Counties showed from 4 to 75 percent of the stems infested with larvae ranging in size from small to half grown, and a few eggs still being laid. (May 19): Counts were made in 10 wheat fields in Tippecanoe County on May 19. Sten infestations ranged from 2 to 74 percent, with an average of 37 percent. Fly forms ranged from small larvae to puparia.

Illinois. W. P. Flint (May 18): The spring brood of the hessian fly has been abundant and destructive in the western and southwestern parts of the State. In the central and eastern parts of the State very little damage has occurred, either from last fall's brood or from the spring brood.

Missouri. L. Haseman (May 23): The spring brood did not get by the severe weather apparently, as fields showing 90 percent of plants infested last fall with up to 60 flaxseeds per plant are now only moderately infested by the spring brood, with an average of about 1 flaxseed per culm, and not showing the expected severe damage. At the time of the emergence of the spring brood of flies in April the cold late spring had most to do with preventing oviposition and hatching.

Kansas. H. R. Bryson (May 25): According to observations made by E. G. Kelly, the infestation is not so heavy this spring in Coffey County as was anticipated last fall. The county agent of Lincoln County reported finding a number of infested plants at Barnard. Heavy infestations were also reported in Bourbon and surrounding counties.

#### CORN

#### CORN EAR WORM (Heliothis obsoleta Fab.)

New Jersey. T. J. Headlee (May 21): Thirty-six square yards of soil 14 inch deep were examined for pupae in April. Sweet-corn fields heavily infested in 1935 were examined and samples were taken from the southern, central, and northern parts of the State. No live pupae were found in any of the samples, whereas in October 1935 similar soil samples contained an average of approximately one pupa per square yard.

Georgia. T. L. Bissell (May 18): Half-grown caterpillars have been found at Experiment on various plants, including rose blossoms and bean leaves.

Mississippi. C. Lyle and assistants (May 23): Unusually heavy infestations on tomatoes have been reported in Rankin, Stone, Jackson, Harrison, Pearl River, and Hancock Counties.

Texas. R. W. Moreland (April): During April five species of plants were examined for eggs of H. obsoleta, with results as follows: Alfalfa, 4,800 plants and 58 eggs; blue-bonnet (Lupinus subcarnosus), 1,280 plants and 30 eggs; blue-bonnets (L. texensis), 1,200 plants; corn, 500 plants; and false indigo, 200 plants without any eggs being found.

California. R. E. Campbell (May 1): Sweet corn coming into the local markets from the Coachella Valley already shows considerable damage.

M. W. Stone (May 19): Adults were collected and eggs found on corn and tomatoes near Santa Ana (Peters Canyon) on May 8. Considerable injury to silks was noted. Eggs collected on tomato near Costa Mesa and San Juan Capistrano on May 12 hatched in the insectary on May 16. First- and second-instar larvae were also observed feeding on tomato foliage at Costa Mesa on May 12.

#### LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

Florida. J. R. Watson (May 21): Many complaints are coming in of injury to cowpeas, corn, and, especially, beans.

#### SOD WEBWORMS (Crambus spp.)

Iowa. C. J. Drake (May 20): Sod webworms are unusually abundant in Iowa this year. Corn planted on newly broken timothy and bluegrass sod is suffering damage from webworms, particularly in the southern part of the State. Near Lamoni and Bloomfield a few cornfields have been almost totally destroyed.

Missouri. L. Haseman (May 23): Sod webworms have been more abundant this spring than usual and many farmers have been obliged to replant corn because of their damage. Most of them are small and not so advanced as usual for the season.

#### EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. N. Turner (May 23): Moths began emerging on May 20 at Mount Carmel. This is much earlier than usual.

#### CORN BILLBUGS (Calendra spp.)

Iowa. C. J. Drake (May 20): About three species of corn billbugs have been reported from southern and northern Iowa. Near Algona a 40-acre cornfield was totally wiped out by them.

Kansas. H. R. Bryson (May 21): The maize billbug (C. maidis Chitt.) was reported as quite numerous in the valley of the Neosho River, but not so abundant in Wilson County along the Verdigris River. Some reports of injury to young corn plants by the adults have been received.

Oklahoma. C. F. Stiles (May 21): The maize billbug has been damaging corn in the lowlands of northeastern Oklahoma.



SUGARCANE BEETLE (Euethiola rugiceps Lec.)

Tennessee. G.M. Bentley (May 25): The rough-headed cornstalk beetle is reported as doing considerable damage to young corn in the community of Rogersville, Hawkins County. It has also been reported in Bledsoe County in the vicinity of Pikeville. Every few years we have a serious outbreak of this beetle and, by its starting early, we anticipate considerable damage this year.

Mississippi. C. Lyle and assistants (May 23): The sugarcane beetle has been found at Durant around corn and has been reported from other points in the Durant district, while complaints of serious damage to corn have been received during the past month from Cruger, Oakland, Kosciusko, and Hermanville. On May 22 the county agent at Calhoun City reported many complaints concerning this pest.

CORN FLEA BEETLE (Chaetocnema pulicaria Melsh.)

Virginia. H. G. Walker (May 25): Very abundant in many cornfields around Norfolk and on the Eastern Shore of Virginia.

ALFALFA AND CLOVER

ALFALFA WEEVIL (Hypera postica Gyll.)

California. A. E. Michelbacher (May 21): Larvae of the alfalfa weevil are becoming rather scarce throughout its entire range in middle lowland California. Serious injury occurred in only one field in the Patterson area of the San Joaquin Valley. After the cutting of the first crop, alfalfa started immediate growth over one-half of the field and now it is being cut for the second time. Over the other half of the field newly emerged adults apparently fed so heavily on the crowns that the alfalfa is only a few inches tall. The larvae are heavily parasitized by Bathyplectes curculionis Thos., the parasitization in many places being 99 percent or more.

Utah. C. J. Sorenson (May 20): The alfalfa weevil is moderately abundant and noticeable damage is in evidence in Millard County.

Colorado. G. M. List (May 22): Adults are numerous in the alfalfa fields at Grand Junction. On May 9 sufficient eggs and small larvae were present to indicate rather severe injury to the first crop.

CLOVER LEAF WEEVIL (Hypera punctata Fab.)

Indiana. J. J. Davis (May 23): The clover leaf weevil was damaging clover at Winchester on May 19. Clover injury was reported from Noblesville on May 7 and, although the report was not accompanied by specimens, the leaf weevil was probably responsible.

Iowa. H. E. Jaques (May): The clover leaf weevil has been reported from the following counties: Osceola, Mills, Monroe, Wapello, Davis, Henry, and Louisa.



CLOVER ROOT BORER (Hylastinus obscurus Marsham)

Oregon. D. C. Mote (April): Adults of the clover root borer were reported at Hubbard, the infestation amounting to 30 percent in one field of Austrian winter field peas adjacent to a 3-year-old field of red clover.

PEA APHID (Illinoia pisi Kalt.)

Wisconsin. C. L. Fluke (May 20): The pea aphid is plentiful on alfalfa in Dane County. Natural enemies such as syrphid flies, ladybeetles, and parasites are also quite active.

Washington and Oregon. L. P. Rockwood (April 21): Low populations, rarely exceeding 200 per 100 sweeps, were found in irrigated fields in Washington near Maryhill, Toppenish, Satus, Mabton, Touchet, and Walla Walla, and near Milton-Freewater, Blue Mountain, Stanfield, Hermiston, Umatilla, Irrigon, Arlington, and The Dalles in Oregon. In one irrigated field near Echo, Oreg., with a southern exposure and protected by hills from the cold winter winds, I. pisi averaged 1,300 per 100 sweeps. Unirrigated fields near Maryhill, Wash., Weston and The Dalles, Oreg., yielded from none to 5 per 100 sweeps, and most of those swept were immigrant alates. Coccinellid beetles, especially Hippodamia convergens Guer., were very abundant (10-68 per 100 sweeps), except in the Yakima Valley where the season appeared later than elsewhere. Full-grown larvae of H. convergens and of the syrphid Lasiophthicus pyrastris L. were collected at Echo, Oreg.

Oregon. L. P. Rockwood and M. M. Reeher (May 16): Aphid populations remained at practically the same low levels as in March on fall-sown annual legumes in Washington and Clackamas Counties until April 10 during cool weather. After that date, they multiplied rapidly, especially on Austrian field peas, during a 10-day period of abnormally warm weather without precipitation. This was also a period of remarkably fast growth of all crops. By May 6 the populations in some fields were 100 times as great as they had been on April 10, attaining 3,000 per 100 sweeps in one field. During the first week of May, during a period of moderate but daily precipitation following a similar period in the last week of April, the entomogenous fungus Entomophthora aphidis attained epidemic proportions among aphids in early fall-sown fields. As a result, the aphid populations were reduced 88 percent in some fields.

SPITTLEBUGS (Cercopidae)

Maryland. E. N. Cory (May 25): A severe outbreak of spittlebugs is occurring in Cecil, Harford, Baltimore, and Kent Counties on clover, alfalfa, and weeds. Farmers have been advised to mow hay at once.

Delaware. L. A. Stearns (May 14): A spittlebug, probably Philaenus leucophthalmus L., is abundant in nymphal stages on clover and alfalfa at Odessa and Middletown. Several varieties are present.

Oregon. D. C. Mote (May): P. leucophthalmus was hatching in considerable numbers on April 25 in the Willamette Valley. The first adult was observed on May 19. Reported by W. D. Edwards.

COWPEAS

COWPEA CURCULIO (Chalcodermus aeneus Boh.)

Georgia. T. L. Bissell (May 21): Weevils have been found on volunteer cowpeas at Experiment since May 5. They are feeding somewhat on leaves and stems.

GRASS

MEADOW PLANT BUG (Miris dolabratus L.)

Kentucky. W. A. Price (May 26): The meadow plant bug is abundant on bluegrass in Fayette, Scott, Woodford, Bourbon, and Clark Counties.

FLAX

FALSE CHINCH BUG (Nysius ericae Schill.)

North Dakota. J. A. Munro (May 27): The wingless nymphs are present in countless numbers in a 40- to 50-acre field of flax 7 miles west of Lisbon, Ransom County. The owner of the field states that a week ago the rows of flax were showing over the entire field. Yesterday when we saw the field it was completely bare except for a few low spots. The field had been in grass and weeds for the last 10 years and was plowed just prior to seeding flax this spring. A grassland pasture adjoining the field is also overrun by the bugs.

F R U I T I N S E C T S

NEW YORK WEEVIL (Ithycerus noveboracensis Forst.)

Connecticut. M. P. Zappe (May 23): Adults rather abundant on peach twigs near Cheshire, where they are gnawing into the bases of new shoots.

North Carolina. C. H. Brannon (May 20): New York weevil attacking apple trees in a large orchard in Alexander County.

FLOWER THRIPS (Frankliniella tritici Fitch)

Delaware. P. L. Rice (May 7): This thrips, which appeared in abundance on young fruit and leaves of apple shortly after petal fall in 1935, was found in a number of orchards in Kent and Sussex Counties early in May. Infestations were very light, as compared with those of 1935.

Michigan. R. Hutson (May 20): F. tritici is abundant beneath the shucks and on the leaves of peach trees in the vicinity of Sodus, in Berrien County.



EUROPEAN FRUIT LECANIUM (Lecanium corni Bouche)

Michigan. R. Hutson (May 20): Adults of the European fruit lecanium are very abundant in the vicinity of Lansing.

Oklahoma. F. A. Fenton (May 23): The European fruit lecanium continues to be the outstanding insect pest of the State. It is found principally on elms, but is also recorded as occurring on Osage orange and soft maple. The pest is still in the egg stage.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. N. Y. State Coll. Agr. News Letter (May 25): The first codling moths of the season were collected in bait traps on the night of May 22 in the Hudson River Valley. On this night 25 moths were caught in 52 traps in orchards in the vicinity of Poughkeepsie. Night temperatures during the month indicate that this was the first moth-flight period of the season. Of a few specimens examined on May 22 it was determined that less than 30 percent of the overwintered larvae had pupated.

Pennsylvania. H. E. Hodgkiss (May 27): The first peak of emergence occurred between May 15 and 18 in Cumberland and York Counties. In Union County in the north-central area the first peak was on May 17 and 18, and a second large emergence started on May 22. Flight records were taken from bait pails.

Delaware. L. A. Stearns (May 23): Emergence of the spring brood is 75 percent complete; first brood larvae hatched May 17; development earlier than usual.

Maryland. E. N. Cory (May 12): First emergence of the codling moth on Eastern Shore, May 7; western Maryland, May 9; and emergence from cages May 12.

Virginia. W. J. Schoene (May 26): The emergence of the codling moth reached a definite peak on May 9 at Crozet. The emergence of unusually large numbers of adults within a short period was evidently due to the very high temperatures.

Ohio. T. H. Parks (May 25): Moth emergence in Lawrence County began May 8; at Columbus and Wooster, May 17; and in the lakeshore counties on May 18. It is unusual for emergence along the lake to so closely parallel that in central Ohio. First cover sprays have been recommended for all sections based on this emergence and the daily evening temperatures. Bait pans at Columbus have caught fairly large numbers of moths nightly since May 21. The first larval entrances were observed in Lawrence County on May 20.

Indiana. L. F. Steiner (May 7): The first moth appeared in traps at Bicknell on May 4. The daily catch has increased slowly until 90 were captured



today in 338 baited trees. (May 21): Spring-brood emergence began April 30 at Elberfeld. Bait-trap catches at Vincennes and Bicknell reached their peaks on May 16 and 17. Small numbers of larvae were hatching by May 14.

J. J. Davis (May 23): Codling moths are emerging in noticeable numbers in some localities. G. E. Marshall found the first adults at Orleans on May 4. The peak of emergence for southern Indiana was from May 8 to 14. Bait traps are located at the following points in the northern half of Indiana, and the dates of first codling moth catches are: La Fayette, May 16; Denver, May 16; Saint Joe, May 16; La Porte, May 20; Bristol, none to date.

Illinois. W. P. Flint (May 18): There was a heavy emergence of adults from overwintering larvae at all points in the southern half of the State, starting May 5 and reaching a peak in southern Illinois between May 8 and 10. Newly hatched larvae were first found entering the fruit in extreme southern Illinois on May 13.

Michigan. R. Hutson (May 9): On May 8, in field observations at Mason, 50 percent of the codling moth larvae were found pupated.

Missouri. L. Haseman (May 23): The codling moth began emerging the last days of April in southern Missouri and by the end of the first week emergence was general over most of the State. First worms entered fruit in southern Missouri between May 11 and 15. Bait-trap catches indicate only a moderate number of first-brood moths in orchards. Heaviest emergence in southern Missouri was from May 5 to 18 and in northern Missouri from May 10 to 20.

H. Baker (May 26): The first codling moths were caught in bait traps at Saint Joseph on May 7, and large catches were taken during the period May 14-22. Only a few scattering worm entrances have been observed to date.

Colorado. G. M. List (May 22): The first codling moths were taken in traps at Paonia by J. H. Newton on May 3. There was a low winter mortality of the overwintering larvae in that section.

Washington. E. J. Newcomer (May 19): Emergence of moths began on May 4 in the Yakima Valley with large numbers emerging from the 10th to the 13th. This is about the same time as last year, although the development of the apples is about a week ahead of last year.

#### EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

Connecticut. W. E. Britton (May 19): Nests are very numerous in some localities. Caterpillars are now about half grown. Gray birches along the roadside in Wallingford were nearly defoliated on May 14.

New York. N. Y. State Coll. Agr. News Letter (May): Infestation by tent caterpillars is general in the Hudson River Valley and the western New York fruit district, although probably not so intensive as last year.

R. E. Horsey (May): Two tents  $1\frac{1}{2}$  inches in diameter, with larvae  $\frac{1}{4}$  inch in length were seen on crabapple on May 2 at Rochester. Since then they have become very numerous, more so than I have ever seen them. As many as 12 nests were found on one small native crabapple tree, and over 200 nests were removed from about 7 acres of ornamental and native crabapples. They were bad on Japanese quince, cotoneasters, wild plum, ornamental cherries, etc. A note from Gates on May 18 said, "We have been having quite a time with tent caterpillars in our hedge (English hawthorn) and cherry trees. We thought we had them all cleared out but found a number of large nests in one of the cherry trees today."

New Jersey. T. J. Headlee (May 21): The eastern tent caterpillar is less abundant than last year but is still present in considerable numbers in the northern half of the State. The caterpillars are about full grown and many of them have gone into migration. Egg parasites were common but not abundant in the eggs laid last fall.

Pennsylvania. R. M. Baker (May 22): M. americana was observed hatching as late as the last week in April in Crawford County.

H. E. Hodgkiss. (May 27): Eastern tent caterpillar is very abundant in Bradford, Susquehanna, and Centre Counties. Elsewhere it appears to be less abundant than in 1935.

Maryland. E. N. Cory (April 3): First noticed the tent caterpillar on cherry and apple trees in Worcester County on April 3, in Talbot and Queen Anne Counties on April 4, and southern Maryland on April 9.

Tennessee. G. M. Bentley (April 15): Tent caterpillars are very abundant again this year on wild cherry and apple trees in all parts of Tennessee.

#### FRUIT TREE LEAF ROLLER (Cacoecia argyrospila Walk.)

Pennsylvania. H. E. Hodgkiss (May 27): Infestation of fruit tree leaf roller severe in some orchards. Not general in the State.

#### APPLE APHIDS (Aphidae)

Connecticut. P. Garman (May 19): Rosy apple aphid (Anuraphis roseus Baker) very abundant in some localities in New Haven County.

New York. N. Y. State Coll. Agr. News Letter (May): All three species of the apple aphids appear to be more abundant than usual in the Hudson River Valley. The rosy apple aphid is the predominating species in the western fruit district. In both places syrphid flies and ladybeetles are holding the aphids in check.

Maryland. E. N. Cory (April 29): Rosy apple aphid observed attacking apple at Sandy Spring.

Wisconsin. C. L. Fluke (May 20): Apple grain aphid (Rhopalosiphum prunifoliae Fitch) infests 75 to 90 percent of terminals in Crawford County. Green



apple aphid (Aphis pomi DeG.) is practically absent in the western apple orchards in Crawford County.

Missouri. L. Haseman (May 23): Some rosy aphid present in southwestern Missouri and in the west-central portion but generally aphids are less abundant than usual.

Colorado. G. M. List (May 22): The rosy apple aphid is somewhat more numerous than usual in Delta and Mesa Counties and was reported for the first time from Montezuma County.

#### LEAFHOPPERS (Cicadellidae)

Connecticut. P. Garman (May 19): It was estimated that from one-fourth to one-half of the white apple leafhopper (Typhlocyba pomaria Mc.) had emerged at the time of calyx spray.

Pennsylvania. H. E. Hodgkiss (May 27): T. pomaria hatching on May 13 in Berks County. Infestation heavy in some orchards.

Missouri. L. Haseman (May 23): There was a heavy overwintering crop of the red-spotted (Erythroneura maculata Gill.) and red-striped (E. obliqua Say) leafhoppers, but in the last 2 weeks they have been less noticeable on foliage, owing to spread and possibly dying following egg laying. First nymphs of these seemingly beginning to show up. The white apple leafhopper, which passes the winter in the egg stage, is fairly abundant and the first-brood mating occurred from May 15-20 in central Missouri.

#### APPLE REDBUGS (Miridae)

New York. N. Y. State Coll. Agr. News Letter (May): Red bugs have injured the terminal growth in several orchards in the lower Hudson River Valley. Reports from Orleans and Wayne Counties also indicate injury.

New Jersey. T. L. Guyton (May 21): Apple redbug (Lygidea mendax Reut.) are rather numerous in part of an apple orchard at Lebanon.

Pennsylvania. H. E. Hodgkiss (May 27): Both species, L. mendax and Heterocordylus malinus Reut., are abundant through the State. They were hatching on May 5 and 6.

#### SAN JOSE SCALE (Aspidiotus perniciosus Comst.)

Georgia. O. I. Snapp (May 20): Most of the San Jose scales are dead in peach orchards sprayed last winter for the control of this insect at Fort Valley. In these orchards, crawlers and recently set-up young are rather scarce.

Tennessee. G. M. Bentley (May): In many of our peach and apple orchards of western Tennessee San Jose scale is showing up in appreciable numbers.

Missouri. L. Haseman (May 23): San Jose scale is not breeding up heavily, probably on account of severe winter mortality.



Wisconsin. E. L. Chambers (May 20): More than 600 city properties in southern Wisconsin were sprayed during April with a miscible oil in a clean-up campaign against the San Jose scale. New infestations were found following an intensive survey in 6 new localities. This insect has not yet reached the commercial fruit-growing districts of the State.

North Dakota. J. A. Munro (May 18): Examination of a cotoneaster hedge at Fargo showed a heavy infestation of San Jose scale. All insects above the snow line were dead, but where protection has been afforded by snow the survival was about 5 percent.

FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Missouri. L. Haseman (May 23): Adults first observed on May 18-20. Expect another bad siege, although some increase of parasites last year may help.

Nebraska. M. H. Swenk (May 20): During the period from April 21 to May 20 numerous complaints of damage to fruit and shade trees by the flat-headed apple tree borer continued to be received. These came from Douglas, Saunders, Saline, Platte, York, Hall, Holt, and Redwillow Counties.

APPLE FLEA WEEVIL (Orchestes pallicornis Say)

Ohio. T. H. Parks (May 25): Adult flea weevils overwintered in large numbers in some orchards and migrated to the new apple leaves in the delayed dormant stage of bud development. Prompt sprays gave fairly good control. On unsprayed trees larvae are now full grown in their blotch mines.

APPLE CURCULIO (Tachypterellus quadrigibbus Say)

Pennsylvania. H. E. Hodgkiss (May 27): Adults of apple curculio were depositing eggs in apples in York County on May 20. One larva was found feeding in young apple.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (May 19): European red mites are abundant in some orchards in New London County. Mites were mature and laying eggs at the time of the calyx spray.

Pennsylvania. H. E. Hodgkiss (May 27): First-generation individuals of European red spider mature in Dauphin County on May 6. Eggs deposited by first-generation adults hatching in Adams County on May 21.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

- Connecticut. P. Garman (May 19): Beetles of plum curculio out of hibernation in New Haven County but not working on fruit as yet.
- Delaware. L. A. Stearns (May 23): The first overwintered adults were collected by jarring on April 17 at Bridgeville. Injury by first-brood grubs subnormal.
- Pennsylvania. H. E. Hodgkiss (May 27): First observation of plum curculio in Lancaster County was on May 11, when they were feeding on apple and plum. No feeding seen on peach, even where interplanted with apple.
- Maryland. E. N. Cory (May 13): Plum curculio was found ovipositing on peach on May 13 at Avanel.
- Virginia. W. J. Schoene (May 26): A heavy second brood of the plum curculio is in progress. The overwintering adults reached the orchard between April 24 and May 25. Large numbers arrived about May 1. The wormy peaches were dropping in large numbers on May 20-23, infestation running as high as 95 percent. In one orchard drops in the center of the peach block averaged 50 percent wormy and those on the outside of the blocks averaged 90 percent. The fruit is very small, about 1,000 to the gallon.
- Georgia. O. I. Snapp (May 6): The peak of first-brood larval emergence from peach drops at Fort Valley occurred on May 4, which is 6 days later than the peak emergence in 1935. (May 25): Nearly all of the overwintered adults are dead, as revealed by recent jarring of commercial orchards at Fort Valley. First-generation adults have not yet started to emerge.
- Ohio. T. H. Parks (May): Scars from the plum curculio are very scarce and no special sprays on apple have been necessary.
- Indiana. L. F. Steiner (May 21): Injuries were noted at Vincennes on Ben Davis apples as early as May 5, only a few days after petal fall. The pest is more abundant than usual and is doing considerable damage throughout the district.
- Illinois. W. P. Flint (May 13): Plum curculio is more abundant in southern Illinois than it has been at any time during the past 3 years. Jarring records made by S. C. Chandler show a considerable increase in numbers of adults taken during the past 2 weeks. The wet season of 1935 certainly enabled this beetle to stage a strong comeback.
- Michigan. R. Hutson (May 9): On May 8 we jarred some trees at Mason and East Lansing. C. nenuphar was recovered at both places. These recoveries were, without doubt, due to the extremely warm weather of the past few days. The buds are in the prepink stage.



Tennessee. G. M. Bentley (May): In peach and plum orchards where timely sprays have not been applied a large number of the curculio is present generally over the State.

Mississippi. C. Lyle (May 23): Injury by the plum curculio is rather general in unsprayed orchards, although only light damage is reported in the central and southwestern parts of the State. Inspector J. E. Lee at Poplarville reports wild plums in Pearl River County heavily infested, one count showing 94 percent infestation.

Minnesota. A. G. Ruggles (May 22): Plum curculio is moderately abundant in Hennepin County.

Missouri. L. Haseman (May 23): In central Missouri there was an early May appearance of curculios and both apples and stone fruits were attacked generally, but at first punctures were mostly for feeding. In the peach district of southwestern Missouri stone fruits were also badly attacked with worms in fallen fruit May 20-22.

#### A FLEA BEETLE (Chalcoides helxines L.)

Connecticut. M. P. Zappe (May 22): Considerable feeding on leaves by adults. Most abundant in peach orchards at Southington on those trees adjoining hedgerows containing chokecherries. Probably more beetles on chokecherries than on peach. Injury not serious on either plant.

#### ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Delaware. L. A. Stearns (May 23): Emergence of spring brood practically complete; first-brood larvae feeding in twigs are about half grown.

Pennsylvania. R. M. Baker (May 13): Terminal infestation on young peach quite noticeable at Rutherford. Not quite so bad on elder trees.

Georgia. O. I. Snapp (May 20): Oriental fruit moth infestation is light at Fort Valley.

Ohio. E. W. Mendenhall (May 20): Quite bad on the peach trees in central Ohio that are left alive from the severe freezes of last winter. The tips of the peach limbs are quite noticeable from their injury. Their population will be somewhat decreased on account of so many peach trees being killed last winter. They will no doubt attack other fruit trees.

Missouri. L. Haseman (May 23): Oriental fruit moth is more abundant at Cape Girardeau than usual. The first brood is causing much damage to tips and worms are occasionally entering green fruit.

Mississippi. C. Lyle (May 23): Oriental fruit moth injury to peach twigs was observed by Inspector N. L. Douglass at Water Valley and Grenada about the middle of May. At State College this injury is much lighter than in the spring of 1935. Some orchards heavily infested last year show no injury at all this season.



PEACH BORER (Aegeria exitiosa Say)

Georgia. O. I. Snapp (May 9): A male peach borer moth was taken at Fort Valley this morning while trees were being jarred for the curculio. This individual evidently emerged on May 8, as it was taken shortly after 4 a.m., and according to our observations emergence does not take place before 7 a.m. Furthermore, the freshly cast pupal skin containing recently dried fluid was found on the tree next to the one from which the individual was jarred. Moths have not been taken in the orchards earlier than May 27 before this year. (May 20): The infestation is heavy in orchards at Fort Valley that were not treated for this insect. Pupation is starting unusually early. Thirty-four cocoons and 20 freshly cast pupal skins were removed during the period May 9-18 as a result of the examination of 223 trees in one commercial orchard. In a second orchard, 1 cocoon and 1 cast pupal skin were removed during the examination of 60 trees on May 12, and in a third orchard 4 cocoons were removed during the examination of 103 trees on May 15 and 18. Peach borer pupation in numbers is starting earlier than in any year since the insect has been under observation in this latitude.

PEACH TWIG BORER (Anarsia lineatella Zell.)

Utah. C. J. Sorenson (May 20): The peach twig borer is moderately abundant in Davis County. The overwintered broods have been emerging as adults during the past 2 weeks.

A MEGACHILID (Anthidium sp.)

Arizona. C. D. Lebert (May 19): A leaf-cutting wasp, possibly A. emarginatum Say, caused severe defoliation of peach and apricot trees in a small grove near Higley. The peach trees had their foliage badly riddled. Some injury to the foliage of Chinese elm and umbrella trees was noted.

GREEN PEACH APHID (Myzus persicae Sulz.)

Pennsylvania. H. E. Hodgkiss (May 27): There is a general infestation of green peach aphid through the State.

A LEAFHOPPER (Macropsis trimaculata Fitch)

Michigan. R. Hutson (May 20): The leafhopper, reported to be responsible for the spread of certain virus diseases on peach, started hatching May 10 at East Lansing.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (May): In the Hudson River Valley most of the eggs of pear psylla had hatched by the middle of the month, after which date a few summer flies were observed. In

western New York hatching was well under way by the middle of the month, but some eggs were still unhatched by the 25th.

PEAR THRIPS (Taeniothrips inconsequens Uzel)

Washington. I. W. Bales (May 4): Pear thrips have caused considerable damage in Clark County this spring. Some orchards have suffered as high as 75 percent blossom injury.

Oregon. S. C. Jones (May): In the Willamette Valley emergence of adults stopped on April 22. The larvae have been hatching since April 17. In the Umpqua Valley larvae have been hatching since April 1. The larvae were practically full grown and had left the trees by May 12.

CHERRY

CHERRY LEAF BEETLE (Galerucella cavicollis Lec.)

Michigan. R. Hutson (May 20): Reported doing considerable damage to sour cherries in the vicinity of Traverse City.

PLUM

HOP APHID (Phorodon humuli Schrank)

California. L. M. Smith (May 18): The production of migrants on French prunes in the Sonoma Valley was practically complete by May 15, marking the close of an unusually heavy infestation on the trees. Large numbers of migrants (10-50 per leaf) were found on the terminal leaves of hops, while numerous immature alienicolae were found on the older, lower leaves of this plant.

SAY'S BLISTER BEETLE (Pomphopoea sayi Lec.)

Ohio. T. H. Parks (May): These blister beetles were sent from New Concord on May 1 with the statement that they were devouring plum blossoms.

RASPBERRY

RASPBERRY CANE BORER (Oberea binaculata Oliv.)

Minnesota. A. G. Ruggles and assistants (May 18): Raspberry cane borer very abundant, causing heavy damage to raspberries in Clearwater County, according to J. T. Barnes.

GRAPE

GRAPE LEAF FOLDER (Desmia funeralis Hon.)

Missouri. L. Haseman (May 23): Bearing vines at Columbia are not showing injury but newly set young plants were badly attacked by grape leaf-roller on May 15.

GRAPE ROOT WORM (Fidia viticida Walsh)

Delaware. L. A. Stearns (May 22): There is a rather serious infestation of grape root worm on Moore's Early and Concord varieties at Smyrna.

GRAPE PLUME MOTH (Oxyptilus periscelidactylus Fitch)

Ohio. T. H. Parks (May 21): Specimens of the larvae of grape plume moth were received from Hamilton County with the statement that they were feeding on grape foliage.

GRAPE LEAFHOPPER (Eyrthroneura comes Say)

Delaware. L. A. Stearns (May 13): First overwintered adults of grape leafhopper observed on grape at Camden today.

GOOSEBERRY AND CURRANT

GOOSEBERRY FRUIT WORM (Zophodia grossulariae Riley)

New York. N. Y. State Coll. Agr. News Letter (May 4): Recently the gooseberry fruit worm has caused heavy losses in gooseberry and currant plantings in the Hudson Valley.

IMPORTED CURRANT WORM (Pteronidea ribesii Scop.)

New York. N. Y. State Coll. Agr. News Letter (May 18): Found imported currant worms were working on currants on May 12 in Ulster County.

Ohio. T. H. Parks (May 20): The larvae of imported currant worms are now about half grown and are rapidly defoliating currants and gooseberries in some plantings at Columbus.

PECAN

PECAN NUT WORM (Acrobasis caryae Grote)

Louisiana. W. C. Pierce (April 24): Larvae and pupae of the pecan nut case bearer were collected in pecan shoots at the Robson Experimental Station. The number of injured shoots ranged from two to four per tree on 6-year-old pecan trees. On May 14 the first case-bearer eggs were collected on young pecan. Eggs were in late stage of development with none hatched at this time. Damage will probably be noticed by pecan growers this year on account of the light pecan crop, which is confined to a few varieties.

PECAN LEAF CASE BEARER (Acrobasis juglandis LeB.)

Louisiana. W. C. Pierce (May 7): Considerable damage has been caused by larvae of the pecan leaf case bearer feeding on buds and new growth of pecan in southwestern Louisiana near De Ridder.



### PHYLLOXERA (Phylloxera spp.)

Mississippi. C. Lyle and assistants (May 23): Numerous complaints of damage to pecans have been received during the month. Specimens of P. devastatrix Perg. were received from correspondents at Rolling Fork, Yazoo City, Charleston, Leland, and Satartia. P. notabilis Perg. was received from Pattison, and a complaint unaccompanied by specimens came from Vicksburg. A report was received of damage to a pecan tree at Leland.

Louisiana. W. C. Pierce (May 5): The first open galls of P. devastatrix were observed near Shreveport on Schley pecan trees. The gall opening period on Stuart and Success varieties is a little later than on the Nelson and Schley varieties. Severe damage has been caused on pecan trees at locations scattered along the Red and Mississippi Rivers. (May 7-15): Light infestations of Phylloxera sp. (undetermined) have been observed on pecan trees in southwestern Louisiana and on trees growing along the Red and Mississippi Rivers. The most severe infestation was observed on Nelson variety, which was also attacked by P. devastatrix.

### PECAN APHIDS (Aphididae)

Georgia. T. L. Bissell (May 21): Melanocallis caryaefoliae Davis, the black pecan aphid, is present in moderate numbers. A small number of feeding spots being present at Experiment. Monellia costalis Fitch is very abundant at Experiment. M. nigropunctata Granovsky is present in moderate numbers on pecan at Experiment.

### A SAWFLY (Periclista sp.)

Louisiana. W. C. Pierce (May 1-15): Small holes in pecan leaflets caused by the feeding of sawfly larvae have been observed in every pecan orchard visited in this State. Practically no damage has been caused.

### OBSCURE SCALE (Chrysomphalus obscurus Comst.)

Mississippi. C. Lyle and assistants (May 23): An infestation of obscure scale on pecan trees at Shaw was reported by Inspector N. E. Douglass, who also stated that a few oak trees had been killed by this insect and others severely injured. In the Delta this scale is causing damage to pecan trees.

Louisiana. W. C. Pierce (May 7): Ten-year-old pecan trees severely encrusted with obscure scale were observed near De Ridder. It is unusual to find pecan trees of this age heavily encrusted with this scale. In northern Louisiana damage is confined mostly to the lower parts of trees from 20 to 30 years old or over.

CITRUS

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (May 19): It seems that the fumigation and scale clean-up around Phoenix during the past season has been 100 percent efficient. No live adult scales or crawlers have been found on either citrus or ornamentals. Check trees in formerly infested groves fumigated this spring were negative.

COTTONY CUSHION SCALE (Icerya purchasi Mask.)

Florida. H. T. Fernald (May 23): The fluted or cottony cushion scale is very abundant in the Orlando section on prickly pear, but I have not seen any on citrus.

Mississippi. C. Lyle (May 23): An infestation of cottony cushion scale on pecan was sent in by a correspondent at Hattiesburg on May 2.

Arizona. C. D. Lebert (May 19): A light-to-moderate infestation of this scale was found in a grapefruit grove near Phoenix. The Australian ladybeetle (Rodolia cardinalis Muls.) was also present and each scale cluster had from 3 to 7 larvae around it. The beetles were building up nicely.

CITRUS WHITEFLY (Dialeurodes citri Riley & How.)

Mississippi. J. E. Lee (May 23): The citrus whitefly very abundant in the vicinity of Poplarville. A number of Cape-jasmine plants have been completely defoliated.

ORANGE TORTRIX (Tortrix citrana Fern.)

Florida. J. R. Watson (May 21): W. L. Thompson, of our Citrus Station at Lake Alfred, reports that he has seen more orange tortrix than for several years.

A THRIPS (Frankliniella sp.)

Florida. J. R. Watson (May 21): Thrips multiplied rapidly during this dry period in the month of April and the first half of May.

Correction.--The note on page 39 of the Insect Pest Survey Bulletin volume 16, number 2 (April 1, 1936), Scirtothrips citri Moul. should read Frankliniella sp.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (May 21): Dry weather has caused rapid development of rust mites and there has been much spraying for them.

SIX-SPOTTED MITE (Tetranychus sexmaculatus Riley)

Florida. J. R. Watson (May 21): The six-spotted mite has been more injurious to grapefruit than for many years, in most sections of the State causing a severe leaf drop, in some cases as much as 50 percent. The leaves are maturing at the present time and the damage from this mite is subsiding.

DATE PALMS

A CERAMBYCID (Prionus sp.)

Arizona. C. D. Lebert (May 19): The larvae of a cerambycid, probably P. californicus Mots. or P. heroicus Semen, were found in date palms and offshoots at Litchfield Park. Numerous tunnels in the mother palms and all the offshoots on three parent plants were either dead or dying. Twenty-seven large larvae were taken from three small offshoots. The injuries were confined to one side of the field and to four or five trees.

NAVEL ORANGE WORM (Myelois venipars Dyar)

Arizona. P. Simmons (May 27): Moths reared from dates near Phoenix were sent in by P. Simmons and determined by C. Heinrich as M. venipars.

T R U C K - C R O P I N S E C T S

VEGETABLE WEEVIL (Listroderes obliquus Klug)

Mississippi. C. Lyle and assistants (May 23): Early in the month infestations were reported on tomato at Hazlehurst and on cabbage at McCool. This pest has been very active during the month, damaging turnips in Hinds, Rankin, Holmes, and Yazoo Counties.

California. A. E. Michelbacher (May 21): In parts of the San Francisco Bay region newly set tomato plants have been seriously injured.

FLEA BEETLES (Halticinae)

New York. N. Y. State Coll. Agr. News Letter (May): Flea beetles were reported as injurious in western New York during the latter half of the month.

Ohio. B. J. Landis (May 4): Adults of the striped cabbage flea beetle (Phyllotreta vittata Fab.) are common on turnip and early cabbage at Columbus.

Indiana. J. J. Davis (May 23): Flea beetles were damaging small radish plants at New Haven on May 19.



Missouri. L. Haseman (May 23): Several species of flea beetles have been abundant and injurious in gardens in central Missouri.

Mississippi. D. W. Grimes (May 22): Flea beetles are causing damage to turnips at various points.

Nebraska. O. S. Bare (May 19): Numerous small, dark-colored, quick-jumping beetles have riddled the leaves of radishes and cabbage.

California. A. E. Michelbacher (May 21): In parts of the San Francisco Bay region newly set tomato plants have been seriously injured.

STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

Connecticut. W. E. Britton (May 20): Severe damage to young summer squash plants observed in one field on May 11 at New Haven.

N. Turner (May 23): Some cucumbers killed in East Hartford by striped cucumber beetle, which is apparently abundant as usual.

Virginia. H. G. Walker (May 25): The striped cucumber beetle is rather scarce in the Norfolk district.

Ohio. B. J. Landis (May 6): The first adult of the striped cucumber beetle was observed on May 6. On May 10 adults were numerous in a woodlot at Columbus.

Mississippi. C. Lyle and assistants (May 23): A heavy infestation was observed on watermelons in Jackson County and on squash at Durant, Holmes County.

Minnesota. A. G. Ruggles (May): Striped cucumber beetle has been reported as moderately abundant in Morrison, Crow Wing, Rice, and Pipestone Counties.

Missouri. L. Haseman (May 23): In central Missouri the striped cucumber beetles are either slower in showing up or less abundant than usual, as little damage has been done as yet.

Oklahoma. F. A. Fenton (May 23): The two-striped cucumber beetle is injuring the cucurbits.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata Fab.)

Virginia. L. W. Brannon (May 7): Twelve-spotted cucumber beetles were observed feeding in the field at Norfolk on young snap beans for the first time this season on April 20. This is 6 days earlier than the first beetles were observed feeding in 1935.

Georgia. T. L. Bissell (May 5): The first injury to corn by budworms was seen today at Experiment. Beetles were very numerous in March and early April but very few larvae have been found on cover crops.

O. I. Snapp (May 19): The spotted cucumber beetle has been more abundant than usual this spring, and large numbers have been jarred from peach trees at Fort Valley.

Mississippi. C. Lyle and assistants (May 21): Adult beetles are completely destroying a field of watermelons at State College. The larvae were causing unusual damage to corn in the Aberdeen district. (May 22): Twelve-spotted cucumber beetles found on squash at Durant and noticed generally in gardens on other plants.

Kentucky. W. A. Price (May 26): Spotted cucumber beetle present on beans.

Oklahoma. F. A. Fenton (May 23): The twelve-spotted cucumber beetle is injuring cucurbits.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon. D. C. Mote (May): More numerous at this time in the Willamette Valley than for the last few years. Damage to alfalfa has been observed in Linn County. Reported by B. G. Thompson.

STRIPED BLISTER BEETLE (Epicauta vittata Fab.)

Georgia. T. L. Bissell (May 25): Pimiento pepper beds in Butts County are attacked by this blister beetle.

A COCCINELLID (Ceratomegilla fuscilabris Muls.)

Mississippi. J. P. Kislanko (May 23): An unusual case of economic loss due to this ladybeetle has been observed. A canning factory in Laurel rejected several tons of turnip tops and spinach on account of numerous pupae attached to the lower surface of the leaves, which rendered the product unfit for canning.

FALSE CHINCH BUG (Nysius ericae Schill.)

California. A. E. Michelbacher (May 21): In one or two places in the San Francisco Bay region nymphs of the false chinch bug have caused some damage.

S. Lockwood (May 23): Outbreaks of the false chinch bug are now appearing in Napa, Sacramento, and El Dorado Counties. In some fields the bugs are doing considerable damage to young tomato plants which are just now starting to grow in the field.

Nebraska. M. H. Swenk (May 20): On May 16 a Madison County correspondent reported the false chinch bug feeding on radishes, cucumbers, and other garden vegetables.

Arizona. C. D. Lebert (May 19): On account of the dry spring and the consequent sparse growth of mustard weed there has been very little trouble from this pest. One heavy infestation was observed in a citrus

grove near Phoenix where severe injury occurred to the young trees. A mustard cover crop in this grove was responsible for this infestation. Reports from Tucson state that several residents were annoyed by the presence of large numbers of these pests late in April and early in May.

TARNISHED PLANT BUG (Lygus pratensis L.)

Colorado. G. M. List (May 22): The tarnished plant bug was not as abundant on peaches during the blooming period in the peach-growing districts as usual. It has, however, been comparatively numerous on some garden crops in other localities.

GREEN STINKBUG (Acrosternum hilaris Say)

California. S. Lockwood (April 30): The green soldier bug is occurring in large numbers again this year in Merced County. Inspections yesterday gave evidence of far more than normal numbers of this insect.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

New York. N. Y. State Coll. Agr. News Letter (May 18): The Colorado potato beetle is laying eggs in Nassau County.

Delaware. D. MacCreary (May 12): One specimen of Colorado potato beetle observed at Odessa.

Virginia. H. G. Walker (May 25): The Colorado potato beetle is very abundant at Norfolk.

Georgia. T. L. Bissell (May 5): The Colorado potato beetle has become very abundant and injurious on Irish potato at Griffin.

Ohio. N. F. Howard (May 18): The potato beetle is injuring early tomatoes in the field at South Point but is not very numerous on early potatoes.

B. J. Landis (May 7): The first adult was seen flying on May 7 at Columbus. On May 11, 15 adult beetles were counted on a 50-foot row of potatoes. Egg mass on Solanum dulcamara was observed on May 12.

Mississippi. C. Lyle (May 23): The Colorado potato beetle is generally abundant over the State and practically all gardeners are finding control measures necessary.

Missouri. L. Haseman (May 23): Reported by many growers as extremely abundant more so than was expected, following so severe a winter.

Nebraska. O. S. Bare (May 19): Potato bugs seem to be very plentiful this spring.

Oklahoma. C. F. Stiles (May 21): Potato beetles are quite numerous in the vicinity of Edmond and it will be necessary to poison most of the fields to prevent defoliation.



POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

New York. N. Y. State Coll. Agr. News Letter (May 18): Some potato flea beetle injury is showing up in Nassau County.

Pennsylvania. H. E. Hodgkiss (May 27): On May 14 potato flea beetle was just starting on potatoes. The initial infestation is not as large as in most years.

Kentucky. W. A. Price (May 26): Potato flea beetles are common and destructive over the State generally.

Iowa. H. E. Jaques (May 23): Potato flea beetle unusually abundant.

Mississippi. J. E. Lee (May 23): The heaviest infestation of potato flea beetles in several years was noted at Purvis early in May.

Colorado. G. M. List (May 22): Flea beetles, especially E. cucumeris, are damaging tomatoes, potatoes, and many other small plants in several sections of the State.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

Florida. J. R. Watson (May 21): Tomatoes in the Bradenton section show a very light infestation of the pinworm.

POTATO APHID (Illinoia solanifolii Ashm.)

Virginia. H. G. Walker (May 25): The pink and green potato aphid is beginning to appear on potatoes at Norfolk in small numbers.

TOMATO PSYLLID (Paratrioza cockerelli Sulc.)

Colorado. G. M. List (May 22): The tomato psyllid was taken in a "car trap" at Grand Junction April 20 by O. A. Hills. Adults were taken on native host plants at Las Animas, by L. Sweetman on May 2. On May 16 eggs were rather numerous at Fort Collins on tomato plants growing in the coldframe.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Virginia. H. G. Walker (May 25): The Mexican bean beetle appears to have suffered a very heavy winter mortality, as they are very scarce in the field and less than 2 percent have emerged from hibernation cages at Norfolk.

L. W. Brannon (May 7): The first Mexican bean beetle of the season was found feeding in the field in the Norfolk area on April 20. Only one beetle was found on 20 rows of snap beans 300 feet long, so the beetle is apparently one of the first to emerge. Daily observations have been made since the first beans were observed on April 11.

Georgia. T. L. Bissell (May 5): One beetle found today on beans at Griffin. Occasional beetles have been found for 2 weeks on peach trees but this is the first on beans. (May 21): The beetle continues to be scarce at Experiment, doubtless on account of the long-continued dry weather, which is also keeping the beans back. A report that the beetle is injurious at Thomasville has not been verified.

Ohio. N. F. Howard (May 20): The first beetle was found in the field at South Point on May 8 and had apparently been feeding for a day or more. By May 18 a number of beetles were present in each field examined but were less numerous than usual.

#### BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

Virginia. H. G. Walker (May 25): The bean leaf beetle is very abundant at Norfolk and it seems especially destructive because of the dry weather, which has greatly retarded the growth of the beans.

Georgia. T. L. Bissell (May 5): The bean leaf beetle has severely riddled the leaves of snap beans. Injury was first noted about 2 weeks ago at Experiment and Griffin.

Ohio. N. F. Howard (May 18): The bean leaf beetle has been numerous on earl beans at South Point. The first leaves in some fields averaged 20 holes per leaf. Injury to trifoliate leaves is not great and the infestation is subsiding.

Indiana. J. J. Davis (May 23): The bean leaf beetle was reported to be damaging garden beans in a number of localities in the southern half of the State, Terre Haute being the most northern point reported. Most of the reports came in from May 11 to 14.

Kentucky. W. A. Price (May 26): The bean leaf beetle has been more destructive to the bean crop than the Mexican bean beetle, which is very common.

Mississippi. C. Lyle and assistants (May 23): The bean leaf beetle has been rather uniformly destructive over the State.

#### BEAN APHID (Aphis rumicis L.)

California. S. Lockwood (May 25): The bean aphid is causing considerable damage to sugar beets, field peas, and horse beans in the Delta district of Solano County.

#### PEAS

#### PEA APHID (Illinoia pisi Kalt.)

New Jersey. T. J. Headlee (May 21): The first pea aphids on peas were observed on May 18 in southern New Jersey. The infestation is confined to those fields bordering on or near clover and alfalfa fields. Pea



fields situated some distance from clover and alfalfa fields are free from aphids. Weekly aphid surveys have been made since the last week in April, covering 3,500 acres of peas in the southern part of the State.

Virginia. L. W. Brannon (May 7): The first pea aphid of the season in the Norfolk district was found on peas on April 13. Peas have been up in that district since the middle of March and weekly sweepings had been made since that date. On April 24 the first pea aphid of the season on the Eastern Shore of Virginia was found in the vicinity of Meriton. Peas have been up in that district since the middle of March, and weekly sweepings had been made since the first week in April.

Ohio. B. J. Landis (May 12): Pea aphids scarce on canning peas at Chillicothe, Circleville, and Canal Winchester. (May 20): Pea aphid survey on canning peas in Ohio: Pea fields swept are the same and bear the same numbers as those reported May 12; no sweeps were made at Canal Winchester;  $1\frac{1}{2}$  miles north of South Bloomfield--50 sweeps, 13 aphids; 1 mile east of Circleville--50 sweeps, 27 aphids; south edge of Circleville--50 sweeps, 59 aphids; Scippo Creek--50 sweeps, 88 aphids; in a field north of covered bridge on Route 104--50sweeps, 47 aphids; in field near Veteran's Hospital on Route 104--50 sweeps, 107 aphids; 2 miles west of Chillicothe--50 sweeps, 98 aphids;  $2\frac{1}{8}$  miles west of Chillicothe--50 sweeps, 179 aphids; south of city limits of Chillicothe--50 sweeps, 83 aphids. (May 27):  $1\frac{1}{2}$  miles north of South Bloomfield--52 aphids in 50 sweeps; 1 mile east of Circleville on State Route 188--130 aphids in 50 sweeps; south edge of Circleville on State Route 23--171 aphids in 50 sweeps; 4 miles south of Circleville on State Route 23 at Scippo Creek--360 aphids; about 3 miles north of Chillicothe on State Route 104 at wooden bridge--85 aphids in 50 sweeps; across from Veteran's Hospital on State Route 104--170 aphids in 50 sweeps; 2 miles west of Chillicothe on U. S. Route 50--172 aphids in 50 sweeps;  $\frac{1}{4}$  mile west of No. 7--162 aphids in 50 sweeps; south edge of city limits of Chillicothe--456 aphids in 50 sweeps.

Mississippi. C. Lyle (May 23): Infestations of I. pisi were observed on English peas and sweetpeas near State College and Starkville on May 1 and 15.

California. R. E. Campbell (May 14): A 50-acre field of cannery peas in full bloom in Marin County was quite generally infested with the pea aphid, ranging from 3 or 4 to 200 per plant. Although a few syrphid larvae and numerous eggs were present, it was apparent that the infestation was building up and that serious injury would be caused.

#### CABBAGE

##### IMPORTED CABBAGE WORM (*Ascia rapae* L.)

Virginia. H. G. Walker (May 25): Cabbage worms are relatively scarce, although there are a few imported cabbage worms and a few larvae of the diamond-back moth (Plutella maculipennis Curt.) in some fields.



Mississippi. C. Lyle (May 23): The imported cabbage worm is causing severe injury in the Aberdeen district and is fairly abundant at State College and in the trucking section of Copiah and Lincoln Counties.

Washington. R. S. Lehman (May): The cabbage butterfly is doing some damage to cabbage near Walla Walla. Cabbage plants are usually set out in the fall, but a fall freeze killed all the plants, making a spring setting of plants necessary; thus, greater damage by the cabbage butterfly is expected as the plants will mature late.

CABBAGE LOOPER (Autographa brassicae Riley)

Mississippi. L. J. Goodgame (May 23): The cabbage looper is unusually abundant in the Aberdeen district.

CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Walker (May 25): The cabbage aphid is very abundant in some fields of cabbage and seed kale at Norfolk.

Tennessee. G. M. Bentley (May 6): The cabbage aphid is prevalent on young cabbage plants in the western part of the State in the trucking counties, and particularly in Gibson County in the vicinity of Humboldt. These plants were observed on May 6.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. L. W. Brannon (May 7): Adults have been observed feeding on seed-kale plants in the field at Norfolk since March 31. The first eggs were found in the field on April 21. The date of emergence and oviposition is about normal.

Georgia. T. L. Bissell (May 12): Eggs were found in collards today at Experiment.

Mississippi. C. Lyle and assistants (May 23): The harlequin cabbage bug was abundant in the Aberdeen district and around Jackson. Only slight damage in southwestern Mississippi has been observed.

CABBAGE MAGGOT (Hylenryia brassicae Bouche)

Connecticut. N. Turner (May 23): Maggots reported to be much more abundant on cabbage in the Connecticut Valley than usual. Mature larvae were found May 22, somewhat earlier than usual. Two fields of early cabbage showed heavy infestations and 50 percent loss.

New York. N. Y. State Coll. Agr. News Letter (May): The cabbage maggot is more injurious to crucifers on Long Island than it has been for several years. It is also injurious in Niagara and Onondaga Counties.

New Jersey. T. J. Headlee (May 21): The cabbage maggot has been unusually abundant this season, especially in the northern part of the State.

Pennsylvania. H. E. Hodgkiss (May 27): Infestations as a whole are rather light. On May 13 in Fayette County cabbage following a planting of turnips of 1935 was very heavily infested.

CABBAGE CURCULIO (Ceutorhynchus rapae Gyll.)

Ohio. T. H. Parks (May): Cabbage curculios were brought to the office with the statement that they were injuring cabbage near Cincinnati. This insect is rarely brought to our attention.

SQUASH

SQUASH BUG (Anasa tristis DeG.)

Mississippi. D. W. Grimes (May 22): Squash bug found on squash at Durant and noticed generally in gardens on other plants.

Utah. G. F. Knowlton (May 19): Squash bugs were active in the fields before squash seed was planted this season.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Virginia. H. G. Walker (May 25): Onion thrips are very abundant at Norfolk.

Florida. J. R. Watson (May 21): The onion thrips became so bad in Sarasota County on celery that the crop was harvested 10 days or 2 weeks before it would have otherwise been cut. Several fields of beans in Sarasota and Manatee Counties were also a total loss because of depredations of this thrips.

A BLISTER BEETLE (Meloe impressus Kby.)

Minnesota. A. G. Ruggles (May 22): M. impressus is damaging onions at Red Wing, in Goodhue County.

CARROTS

CARROT BEETLE (Ligyrus gibbosus DeG.)

Michigan. R. Hutson (May 20): The carrot beetle has been reported from Garden City.

North Carolina. C. A. Brannon (May 22): This species is causing considerable damage to carrots in Cumberland County.

STRAWBERRY

STRAWBERRY WEEVIL (Anthonomus signatus Say)

Delaware. L. A. Stearns (May 13): Strawberry weevil particularly severe in infestations about the margins of plantings adjoining woodland at

Pennsylvania. H. E. Hodgkiss (May 27): A. signatus is abundant in Union and York Counties, where it wiped out crops.

Michigan. R. Hutson (May 20): Strawberry weevil is abundant in the vicinity of St. Joseph.

A BEETLE (Diplotaxis atlantis Fall)

Connecticut. W. E. Britton (May 19): Moderate injury from D. atlantis on a  $1\frac{1}{2}$ -acre field at East Haven, where in one corner the leaves had been eaten by the adult beetles. Adult also received from New Haven.

STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Missouri. L. Haseman (May 23): The strawberry leaf roller is abundant and was doing much damage in some patches in central Missouri from May 10 to 20.

Nebraska. M. H. Swenk (May 20): A. comptana reported damaging strawberry plants in Gage County on May 18.

Colorado. G. M. List (May 22): Larvae were very numerous in two plantings of strawberries at Grand Junction on May 8 and an occasional moth was flying. The larvae were mostly in the second instar.

STRAWBERRY CROWN BORER (Synanthedon bibiopennis Bdv.)

Oregon. D. C. Mote (April): W. D. Edwards reports that in the Willamette Valley S. bibiopennis left their winter cells and began feeding on April 25.

FIELD CRICKET (Gryllus assimilis Fab.)

Missouri. L. Haseman (May 23): Black field crickets are very abundant in central and northern Missouri, injuring ripe strawberries badly.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (May 21): Three light infestations have been found in Manatee County. The two most severe of these were due to a small planting of hot peppers, which was missed last summer during the clean-up campaign.

SPINACH

A GELECHIID (Gnorimoschema chenopodiella Busck)

Michigan. R. Hutson (May 20): Adults are numerous in spinach plantings at Lake Odessa.



## RHUBARB

### RHUBARB CURCULIO (Lixus concavus Say)

Michigan. R. Hutson (May 20): Reported from Kalamazoo, Flint, and Birmingham.

Indiana. J. J. Davis (May 23): The rhubarb curculio has been reported from several central-Indiana localities as appreciably damaging rhubarb.

## BEETS

### BEET LEAFHOPPER (Eutettix tenellus Bak.)

Montana. J. R. Douglass and D. E. Fox (April): Surveys in the Billings beet-growing district from April 20 to 23 revealed that a small number of females of E. tenellus survived the past winter in that district and that some of the host plants had germinated the previous fall. The surviving adults were found near Billings and Warden, practically in the center of the district where the curly-top disease of sugar beets was most prevalent in 1934 and 1935. The fact that even a few individuals can survive winter conditions in the Billings district is of great importance, as it demonstrates the ability of this pest to survive a moderately severe Montana winter and shows at least a temporary extension of this insect's range.

Utah. G. F. Knowlton (May 19): Beet leafhoppers survived in reasonable abundance again in the Grantsville-Timpie area of Tooele County.

## TOBACCO

### TOBACCO FLEA BEETLE (Epitrix parvula Fab.)

North Carolina. C. H. Brannon (May 15): Flea beetle injury to newly set tobacco is very severe in eastern North Carolina.

## C O T T O N   I N S E C T S

### BOLL WEEVIL (Anthonomus grandis Boh.)

South Carolina. F. F. Bondy (May): Emergence of the boll weevil at Florence has been much lighter than usual.

Mississippi. D. W. Grimes (May 22): One specimen was found on cotton in Leake County on May 19.

Louisiana. R. C. Gaines (May): The boll weevil emerged in much fewer numbers than usual at Tallulah this year.

Oklahoma. C. F. Stiles (May): The emergence of the boll weevil has been lighter than usual at Eufaula.

Texas. R. W. Moreland (May): Emergence has been about normal or a little above normal at College Station.

K. P. Ewing and R. L. McGarr (May 9): All indications are that there are more boll weevils in the field this year than for the last 3 years. More weevils have been collected from the flight screens and more have been observed from plant inspections than previously. During the week ended May 9, three weevils were found on the flight screens and three were found by inspection of 5,800 plants in 24 fields in Calhoun County. Inspections were made May 8 in 5 fields in the Guadalupe River bottom at Victoria. Eight weevils were found on 1,600 plants in this area or an average of 0.45 per 100 plants.

F. L. Thomas (May 29): Boll weevils were found on 15 of 35 farms examined along the coastal plain last week. They were most abundant in De Witt, Goliad, and Refugio Counties.

#### COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. K. P. Ewing and R. L. McGarr (May 16): The first leaf worm of the season was found on May 5 on a farm 1 mile south of Port Lavaca. The worm was about three-quarters grown. On May 15 seven leaf worms were found on a farm about 15 miles south of Port Lavaca.

#### BEE T ARMYWORM (Laphygma exigua Hbn.)

Arizona. T. P. Cassidy (May 2): A small area of seedling cotton in the Buckeye Valley was found by T. C. Barber to be infested on April 30. This is the first occurrence of this insect on cotton reported this season. The first report in 1935 was on May 2. Although the present infestation is small, it indicates that damage may be expected again this year.

#### COTTON APHIDS (Aphidae)

South Carolina. F. F. Bondy and C. F. Rainwater (May 16): Alate and apterous females and nymphs of Aphis medicaginis Koch were found on cotton near Florence the past week. Some cotton plants were severely infested. The root aphids Trifidaphis phaseoli Pass., Anuraphis maidi-radicis Forbes, and Rhopalosiphum sp., were found on cotton during the week. Much cotton has been killed in some fields.

Texas. R. W. Moreland (May 16): In places around College Station fairly heavy infestations of aphid, probably Aphis gossypii Glov., have developed.

K. P. Ewing and R. L. McGarr (May 16): Aphids, probably A. gossypii, have done considerable damage in Calhoun County. Many fields are heavily infested and in a few fields the stand of cotton has been destroyed.

#### COTTON FLEA HOPPER (Psallus seriatus Reut.)

Texas. F. L. Thomas (May 29): Of 35 farms examined last week in 12 counties along the coastal plain, 25 had infestations of the cotton flea hopper. The heaviest infestations were in Goliad, Jim Wells, and Victoria

Counties. Five of the farms had sufficient infestations to warrant control.

K. P. Ewing and R. L. McGarr (May 2): Although the seasonal emergence records at Port Lavaca are not complete, indications are that the peak of emergence occurred from April 27 to 30. The peak of emergence was approximately 3 weeks later than in 1935.

Mexico. C. S. Rude (May 19): Flea hoppers have been observed in several fields near Tlahualilo, but there is no noticeable damage.

#### THRIPS (Thysanoptera)

South Carolina. F. F. Bondy and C. F. Rainwater (May 20): Thrips are much more numerous now than a week ago and an appreciable infestation may develop. The infestation is unusual, according to J. G. Watts, as to the manner of infestation and the species causing it. The infestation is centered in the terminal bud, rather than on the small leaves, and the attacked buds resemble those stung by the boll weevil. Four species have been found on cotton to date, namely, Frankliniella fusca Hinds, F. tritici Fitch, Thrips tabaci Lind., and Sericothrips variabilis Beach. The last-named species is responsible for 75 percent of the total injury.

#### F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

##### CANKERWORMS (Geometridae)

Rhode Island. A. E. Stone (May 28): Cankerworms are apparently abundant in places where they occurred last year.

Connecticut. P. Garman (May 19): Many cankerworms (Alsophila pomataria Harr.) emerged in New Haven County and were feeding at the time of the pink spray, May 5 to 7. Sprays applied at that time gave almost complete control. Shade and woodland trees are heavily infested in some localities.

New York. N. Y. State Coll. Agr. News Letter (May 18): Cankerworms are unusually numerous in Rockland County, especially in the Nyack area. They are seriously injuring oaks, elms, and linden trees. In Dutchess County they are more numerous than last year.

New Jersey. T. J. Headlee (May 21): Cankerworms are abundant and causing considerable injury to forest trees and some shade and street trees in most of the northern half of New Jersey. Four species of worms are present in considerable numbers. These are A. pomataria, Palaearcta vernata Peck, Erannis tiliaria Harr., and Ennomos subsignarius Hbn. The caterpillars are about half grown.

Pennsylvania. H. E. Hodgkiss (May 27): Fall and spring cankerworms are generally abundant.



New Jersey. T. L. Guyton (May 12): Cankerworms are numerous on apple and forest trees at Lebanon.

Ohio. T. H. Parks (May 25): Larvae of the fall cankerworm are defoliating many elms in western Ohio. The infestation extends as far east as Madison County, though the greatest injury is reported from Greene and Clark Counties. The outbreak is very spotted but some complete defoliation has already occurred, although the larvae are still less than half grown.

Michigan. R. Hutson (May 20): Spring and fall cankerworms are very abundant in the vicinity of Lansing, Grand Ledge, and Lake Odessa.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Vermont. H. L. Bailey (May 25): Forest tent caterpillars are very abundant in the southern and western parts of the State. Reports of heavy feeding during the week of May 18 came from Bennington, Windsor, and Addison Counties. The first hatching from eggs was noted at Middlebury on May 4. Apparently most larvae were in the third instar on May 22-

Connecticut. W. E. Britton (May 19): Observed a few caterpillars crawling on trunks of paper birch on my premises at New Haven.

Massachusetts, Connecticut, and New York. E. P. Felt (May 23): The forest tent caterpillar is locally abundant in western Massachusetts, in Connecticut, and in areas of New York adjacent to Massachusetts and Connecticut.

New Jersey. T. J. Headlee (May 21): The forest tent caterpillar has been common but not injurious in wooded areas.

Minnesota. A. G. Ruggles (May 22): Very abundant in the Arrowhead district. On May 20 many were hatching, although none were beyond the second instar.

Mississippi. C. Lyle and assistants (May 23): Specimens were received from Waveland on May 1 with the report that they were defoliating fruit trees and roses. The heavy infestation which existed last month has about disappeared. So many caterpillars were then present that the grade of turpentine produced was considerably lowered.

Louisiana. T. E. Snyder (April): P. Wakeley reports that forest tent caterpillars are defoliating several southern hardwood trees more or less severely. This condition is general from Slidell and Pearl River north through Talisheek and Bush to Bogalusa, and is more severe this season than in recent years.

Utah. G. F. Knowlton (May 20): Poplars and ash are being severely damaged in Washington County by the forest and apple tree tent caterpillar (Malacosoma sp.)

Washington. R. S. Lehman (May): The forest tent caterpillar is doing considerable feeding on fruit trees, especially on prunes at Walla Walla.

BROWN-TAIL MOTH (Nygmia phaeorrhoea Don.)

Rhode Island. A. E. Stene (May 28): A few nests of the brown-tail moth were found for the first time in over 10 years.

LEOPARD MOTH (Zeuzera pyrina L.)

New York. E. P. Felt (May 23): The leopard moth is somewhat generally prevalent though not usually abundant, in shade trees on western Long Island and in the vicinity of New York City.

A SCALE INSECT (Lecaniodiaspis pruinosa Hunter)

Colorado. G. M. List (May 22): This scale has been increasing on the elm and cottonwood at Rocky Ford, until it is now doing considerable injury. The only report of this insect in the State comes from Otero County.

ASH

CARPENTER WORM (Prionoxystus robiniae Peck)

Nebraska. M. H. Swenk (May 20): From Saunders County on May 19 came an inquiry as to the control of the carpenter worm in ash trees.

BANDED ASH BORER (Neoclytus caprea Say)

Nebraska. M. H. Swenk (May 20): The banded ash borer was reported to be working in ash trees in Knox and Saunders Counties on May 15 and 19, respectively.

BEECH

WOOLLY BEECH APHID (Phyllaphis fagi L.)

Kentucky (May 26): Woolly beech leaf aphid very common on beeches in the vicinity of Lexington.

BIRCH

EUROPEAN BIRCH SAWFLY (Fenusa pumila Klug)

Connecticut. W. E. Britton (May 20): Adults observed on May 8 at Hamden. No eggs could be found in the leaves.

A BEETLE (Diplotaxis sp.)

Vermont. H. L. Bailey (May 25): Diplotaxis sp. had stripped foliage from young transplanted white birch trees at East Haven in Essex County on May 20.

CATALPA

CATALPA SPHINX (Ceratonia catalpae Bdv.)

Mississippi. C. Lyle and assistants (May 23): A heavy infestation of the

catalpa sphinx is reported in the cities of Charleston and Grenada and in the vicinity of Laurel.

### ELM

#### ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Vermont. H. L. Bailey (May 25): Adults in numbers reported to be emerging from hibernating quarters about houses at Windsor the first week in May.

California. H. C. Donohoe (April 28): Elm leaf beetles were observed on April 26 to be causing serious damage to foliage in a planting of large elm trees near Fresno.

C. S. Morley (May 4): Elm leaf beetle has been actively feeding on elm trees for the past 3 weeks in Kern County.

#### PIGEON TREMEX (Tremex columba L.)

North Dakota. J. A. Munro (May 18): Pigeon tremex reported as common in elm trees at Crystal in Grand Forks County.

#### ELM BUD GALL (Dasyneura ulmea Felt)

Nebraska. M. H. Swenk (May 20): Specimens of white elm twigs having blasted and malformed buds caused by this small gall midge were received on April 24 from Douglas County.

#### MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Georgia. T. L. Bissell (May 13): The spiny elm caterpillar is present on elm in small numbers at Experiment.

#### EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Wisconsin. E. L. Chambers (May 20): The European elm scale is still restricted to less than a half dozen cities in southern Wisconsin. Drastic control campaigns were carried out in Madison and Milwaukee during March and April.

Colorado. G. M. List (May 22): The winter mortality of the European elm scale was comparatively low, with the result that there will be heavy infestations in most sections of the State where spraying was not done.

### HACKBERRY

#### HACKBERRY BUD GALL (Pachypsylla gemma Riley)

Nebraska. M. H. Swenk (May 20): Specimens of the hackberry bud gall on a branch from a hackberry tree were sent in from Dundy County on May 18.



LARCH

LARCH CASE BEARER (Coleophora laricella Hbn.)

New York. R. E. Horsey (May): Larch case bearer is fairly numerous on Dahurian, European, American, Siberian, and Japanese larches at Rochester. They were feeding on the leaves on May 2, after a temperature of about 80° F., for a couple of days.

LINDEN

LINDEN BORER (Saperda vestita Say)

New York and New England. E. P. Felt (May 23): The linden borer is locally injurious to young trees in southwestern New England and on Long Island.

LOCUST

LOCUST BORER (Cyllene robiniae Forst.)

Oklahoma. F. A. Fenton (May 23): We have received requests for information on control of the locust borer.

MAPLE

A ROOT BORER (Prionus laticollis Drury)

New York. E. P. Felt (May 23): Broad-necked Prionus grubs were found working abundantly in the living roots of silver maples on Long Island.

GLOOMY SCALE (Chrysomphalus tenebriosus Comst.)

Mississippi. C. Lyle (May 23): A correspondent at Doddsville sent in maple twigs heavily infested with this scale on May 1.

OAK

AN OAK GALL (Andricus punctatus Bass.)

New Jersey. T. J. Headlee (May 21): The gouty ash gall seems to be increasing in abundance in the State and is causing some injury to oaks in several plantings.

Pennsylvania. E. P. Felt (May 23): The gouty oak gall was found to be somewhat abundant on oaks in the Philadelphia area.

AN APHID (Myzocallis walshii Monell)

Georgia. T. L. Bissell (May 13): Oak aphids (M. walshii) are exceedingly abundant on oaks at Griffin.

PINE

SOUTHERN PINE BEETLE (Dendroctonus frontalis Zimm.)

Mississippi. H. Gladney (May 23): A large infestation of the southern pine beetle was observed in Harrison County on May 12.

EUROPEAN PINE SHOOT MOTH (Rhyacionia bouliana Schiff.)

Connecticut. E. P. Felt (May 23): European pine shoot moth was found extremely abundant in Mugho pines in Greenfield Hills.

A PINE NEEDLE MINER (Paralechia pinifoliella Chamb.)

Massachusetts. E. P. Felt (May 23): The pine leaf miner was found somewhat prevalent on pitch pine at Belmont.

PITCH-MASS BORER (Parharmonia pini Kellicott)

Massachusetts. E. P. Felt (May 23): The pitch-mass borer was somewhat prevalent in a white pine planting at Waban.

PINE BARK APHID (Pineus strobi Htg.)

New York and New Jersey. E. P. Felt (May 23): Pine bark aphid was reported on white pine in large numbers at Peekskill, N. Y. It was also reported present on white pine at West Orange, N. J.

Wisconsin. E. L. Chambers (May 20): Our white pine blister rust forces are reporting the pine bark louse as being abundant on white and Norway pine throughout the northern part of the State.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Massachusetts. E. P. Felt (May 23): The pine leaf scale was extremely abundant on pine at Stockbridge. This insect usually favors the Austrian pine.

Minnesota. A. G. Ruggles (May 22): Hatching at Wabasha and Fairmont on May 15. Very abundant.

Nebraska. M. H. Swenk (May 20): On May 13 a Cherry County correspondent reported that one of his Black Hills spruce trees was infested with the pine-leaf scale.

SCOTCH PINE SCALE (Toumeyella numismaticum Pettit & McDaniel)

Wisconsin. E. L. Chambers (May 20): The Scotch pine scale, while still prevalent in northern Wisconsin jack pine forests, is apparently less abundant than usual this spring.

SPRUCE

SPRUCE MITE (Paratetranychus uninguis Jacobi)

Connecticut. W. E. Britton (May 19): Leaves of spruce showed result of mite injury last season at Danielson, Hartford, and West Haven.

Pennsylvania. H. E. Hodgkiss (May 21): Spruce mite is very abundant in Franklin County.

WILLOW

WILLOW SAWFLY (Pteronidea ventralis Say)

Delaware. P. L. Rice (May 7): A heavy infestation of the slug was found on a willow tree at Georgetown.

EUROPEAN WILLOW BEETLE (Plagiodera versicolora Laich.)

Pennsylvania. R. M. Baker (May 11): Adults and larvae are abundant on willow at Camp Hill.

A WILLOW SCALE (Chionaspis salicis-nigrae Walsh)

Minnesota. A. G. Ruggles (May 22): C. salicis-nigrae observed in the southwestern part of the State.

I N S E C T S   A F F E C T I N G   G R E E N H O U S E  
A N D   O R N A M E N T A L   P L A N T S

A SAWFLY (Tenthredinidae)

Ohio. T. H. Parks (May): Specimens of sawfly larvae were received from Versailles with the statement that they were infesting evergreens in that vicinity.

OYSTER-SHELL SCALE (Lepidosaphes ulni L.)

Indiana. J. J. Davis (May 23): Oyster-shell scale began hatching at Lafayette about May 20, much earlier than usual.

Minnesota. A. G. Ruggles (May): Oyster-shell scale is moderately abundant in Nicollet, Rice, Murray, Brown, Winona, and Ramsey Counties.

Utah. G. F. Knowlton (May 19): Oyster-shell scale is damaging many shade and ornamental plants in northern Utah, plants often being killed by severe infestations. Serious injury to dogwood and horsechestnut were recently observed at Logan.



ARBORVITAE

CEDAR BARK BEETLE (Phloeosinus dentatus Say)

New York. E. P. Felt (May 23): Arborvitae twigs showing work of cedar bark beetle were received from Babylon, Long Island.

AZALEA

AZALEA SCALE (Eriococcus azaleae Const.)

Mississippi. C. Lyle and assistants (May 23): An infestation of the azalea scale was found this month at Kosciusko but the source of the plan could not be determined. An infestation was also found in Bay St. Louis. On May 19 the scale was found for the first time in the Durant district.

CRAPEMYRTLE

CRAPEMYRTLE APHID (Myzocallis kahawaluokalani Kirk.)

Georgia. T. L. Bissell (May 17): The crapemyrtle aphid is very abundant on crapemyrtle at Griffin.

ELDER

AN APHID (Aphis sambucifoliae Fitch)

Mississippi. J. P. Kislanko (May 23): A heavy infestation on elder at Hattiesburg, causing the leaves to turn yellow, was observed on May 2.

JUNIPER

JUNIPER WEBWORM (Dichomeris marginellus Fab.)

Pennsylvania. E. P. Felt (May 23): The juniper webworm was found to be injuring junipers in the Philadelphia district.

LILAC

LILAC BORER (Podosesia syringae Harr.)

Michigan. R. Hutson (May 20): The lilac borer has been reported from Flint.

MAGNOLIA

A CURCULIONID (Prionomerus calceatus Say)

Mississippi. H. Gladney (May 23): Several of these beetles were collected on a magnolia at Ocean Springs on May 9.

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

Maryland. E. N. Cory (April 15): Magnolia scale was found attacking magnolia at Pocomoke City.

OLEANDER

HEMISPHERICAL SCALE (Saissetia hemisphaerica Targ.)

Mississippi. J. G. Hester (May 23): Oleanders infested with this scale were found in Louisville on May 2.

ROSE

ROSE SAWFLY (Caliroa aethiops Fab.)

New Jersey. J. S. King (May 10): Adults of the European rose slug were abundant in the late afternoon on rose leaves at Everton. Larvae were also present in all stages up to 5/16 inch in length on tea roses.

OBLIQUE-BANDED LEAF ROLLER (Cacoecia rosaceana Harr.)

Ohio. E. W. Mendenhall (May 22): The rose roller is quite bad already in rose gardens in Columbus.

THRIPS (Thysanoptera)

Mississippi. C. Lyle and assistants (May 23): Numerous complaints of thrips on roses have been received from various parts of the State, including Louisville, Coffeetown, Cleveland, Ocean Springs, and Jackson.

ROSE LEAF BEETLE (Nodonota puncticollis Say)

Maryland. J. A. Hyslop (May 30): Practically every blossom of rose and peony in my garden at Annel is ruined by this beetle. As many as 40 beetles occur in a single peony flower and as many as 12 in a rose.

SPIREA

SPIREA APHID (Aphis spiraeicola Patch)

Maryland. E. N. Cory (May 6): Aphids taken on spirea on April 5 at College Park were determined by P. W. Mason as A. spiraeicola.

VERBENA

CHRYSANTHEMUM LEAF MINER (Epomyza chrysanthemi Kewar)

Mississippi. C. Lyle (May 23): Was causing considerable damage to verbena leaves at State College on May 9.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

BUCK MOTH (Henileuca maia Drury)

Texas. O. G. Babcock (May 18): Oak leaf spiny caterpillar first appeared on live oaks 31 miles southeast of Sonora about April 1, but is now grown and about gone. Many cases of local poisoning have been reported. A few parasites are appearing this year.

BEDBUG (Cimex lectularius L.)

Indiana. J. J. Davis (May 23): Bedbugs have been reported from a number of localities in the State as abundant in homes and poultry houses.

Nebraska. M. H. Swenk (May 20): Complaints of the infestation of houses by the bedbug were received from Dodge, Madison, Merrick, Custer, and Frontier Counties from April 21 to May 20.

Colorado. G. M. List (May 22): The hat bedbug (C. pilosellus Horv.) has been brought in during the last 2 weeks from Greeley, Loveland, and Fort Collins. In all cases these were taken in dwellings and were confused with the common bedbug.

MOSQUITOES (Culicinae)

Delaware. D. MacCreary (May 3): The peak of the flight of Aedes cantator Coq. in Delaware City occurred on the above date.

Indiana. J. J. Davis (May 23): Mosquitoes have been quite annoying at Lafayette the past week.

Utah. G. F. Knowlton (May 19): Mosquitoes have been very abundant and annoying in various parts of northern Utah near numerous ponds left by subsiding flood water along various streams and rivers.

Texas. H. E. Parish (May): Mosquitoes have not yet made their appearance in numbers to be of economic importance.

SANDFLIES (Culicoides spp.)

Delaware. D. MacCreary (May 12): Sandflies are very abundant and annoying in salt marshes near Odessa.

Georgia. J. B. Hull (May 25): During the first 3 weeks of April sandflies especially C. canithorax Hoff., were numerous around the marshes near Savannah. There was a marked decrease in the number of adults during last week of April, indicating the end of the heavy spring emergence.



Florida. F. C. Bishopp (May 25): Reports from the east coast of Florida show that sandflies were unusually bad in that locality during the entire winter and spring.

#### TICKS (Dermacenter spp.)

Massachusetts and Maryland. F. C. Bishopp (May 25): The American dog tick (D. variabilis Say) is rapidly increasing in abundance in Maryland in the vicinity of Washington, D. C. This species is the carrier of the eastern form of Rocky Mountain spotted fever, and three cases of this disease have already been reported this season. Unusual abundance of the tick has been reported from eastern Massachusetts.

North Dakota. J. A. Munro (May 18): Rocky Mountain wood tick (D. venustus Marx.) reported from Amidon (Slope County) by D. E. Lawrence. (Det. by C. B. Philips.)

#### CATTLE

##### SCREW WORM (Cochliomyia americana C. & P.)

General. F. C. Bishopp (May 25): Hibernation studies show that the primary screw worm fly overwintered as far north as Valdosta, Ga., and Uvalde, Del Rio, Gonzales, and New Braunfels, Tex. With the coming of warmer weather the usual northward spread of the pest is taking place, infestations having been reported from Menard and Sonora on about April 15, Round Mountain on May 3, and from Adamsville southward on May 21. Adults were taken at Johnson City on May 8. No cases have been reported this season in Texas as far north as Dallas. The population in the vicinity of Uvalde built up rapidly during April. One ranchman reported 120 infestations among his animals. By May 21 infestations had become quite numerous throughout the county.

H. E. Parish (May): C. americana is quite active in Menard County, Tex., and several collections of larvae have been made from the southern part of Kimble County. Practically all calves and lambs develop cases of myiasis. The first infestation of C. americana at Menard was recorded May 8.

Puerto Rico. H. L. Dozier (May 25): On May 2, with the opening up of warmer weather, screw worms were becoming more active over the island. A number of cases were observed in the vicinity of Mayaguez.

##### STABLE FLY (Stonoxys calcitrans L.)

Texas. H. E. Parish (May): Stable flies are causing a great deal of annoyance to livestock in the vicinity of Menard.

##### A BLOWFLY (Phormia sp.)

Oklahoma. F. C. Bishopp (May 25): Fifty cases of myiasis occurring early in May in a number of dehorned cattle shipped into Oklahoma from Old Mexico

-148-

were reported. Upon investigation it was found that infestations were due to a species of Phormia, the black blowfly.

#### HORNFLY (Haematobia irritans L.)

Texas. A. W. Lindquist (April 30): The hornfly is becoming more annoying at Uvalde than during the corresponding period last year.

H. E. Parish (April 10): Hornflies first observed on livestock at Menard. (April 30): Flies quite abundant and causing annoyance to livestock.

#### HORSE

##### A BUFFALO GNAT (Simulium sp.)

Kentucky. W. A. Price (May 26): Buffalo gnats appeared in the tradewater section of Webster, Crittenden, and Caldwell Counties during the latter part of April and early in May, killing about 100 animals, mostly horses, mules, and cattle.

Tennessee. New York Times (News Items) (May 7): Dense swarms of Buffalo gnats, bred during high-water stages this spring, appeared last Sunday and killed 40 horses and mules in the past few days in Shelby County, officials reported today.

#### SHEEP

##### SHEEP KED (Melophagus ovinus L.)

Texas. O. G. Babcock (May 19): This wingless hypoboscoid fly is rather numerous this season on sheep and goats at Sonora, Ozona Junction, in the ranch country in western Texas. This parasite has been introduced many times from the Northern States and is now becoming established, or acclimated to this hot climate. Usually it lets up during the hot season but increases as the cooler weather comes on. Complaints are becoming more numerous.

H. E. Parish (May): Sheep ticks are very abundant on several flocks of sheep in the vicinity of Menard.

#### POULTRY

##### TROPICAL RAT MITE (Liponyssus bacoti Hirst)

Mississippi. C. Lyle (May 23): Specimens of this mite were received from a correspondent at Raymond on April 22. They were causing considerable trouble.

DCGS

FOLLICLE MITE (Demodex folliculorum Simon)

Mississippi. C. Lyle (May 23): An infestation on a dog was found at West Point on May 12.

HOUSEHOLD AND STORED-PRODUCTS INSECTS

TERMITES (Reticulitermes spp.)

Rhode Island. A. E. Stone (May 28): Several complaints of termite prevalence have been sent in.

Connecticut. N. Turner (May 23): Eleven samples of winged termites, R. flavipes Kol., received and 41 infested buildings examined during the past month. Reexamination of buildings shielded with copper shows no reentry of termites.

New York. R. E. Horsey (May 13): Termites reported on May 13 to have seriously damaged old shoring of wood left in the ground around the foundations of a modern office building at Rochester.

Delaware. L. A. Stearns (May 12): Specimens of damaged wood fencing received from Leipsic.

Pennsylvania. H. E. Hodgkiss (May 27): More than the usual number of requests for assistance in controlling termites are being received.

West Virginia. L. M. Peairs (May 23): In a load of apparently fresh manure hauled in for garden use in Morgantown, winged forms of termites emerged in large numbers within a week of its delivery (about April 3) and continued to emerge for at least 6 days. Examination showed many workers, apparently in good condition, notwithstanding the disturbance to which they had been subjected. As late as May 15 the remnants of the manure heap were examined and workers were still to be found, possibly surviving individuals or a colony.

Ohio. E. W. Mendenhall (May 1): R. flavipes quite bad in some of the old houses in Sumnerford, Madison County.

Indiana. J. J. Davis (May 23): The usual enormous number of inquiries about termites have been received. Over 100 specific requests have been received since January.

Michigan. R. Hutson (May 20): Reports of termite damage have been received from Holland, Coldwater, Jackson, and Grand Rapids.

Tennessee. G. M. Bentley (April 18): Termites continue to be destructive in all parts of the State.



Nebraska. M. H. Swenk (May 20): Reports of damage to houses by N. tibialis Bks. were received from Buffalo and Dawes Counties, during the last month. This is the first report in Nebraska from as far northwest as Dawes County.

Oklahoma. F. A. Fenton (May 23): A large part of our correspondence deals with the question of termite control.

#### ANTS (Formicidae)

Virginia. H. G. Walker (May 25): What appears to be the pavement ant (Tetramorium caespitum L.) is causing severe injury to many eggplants in the Norfolk district. The ants bark the stems of the plants below ground, causing them to die.

Indiana. J. J. Davis (May 23): Ants have been frequently reported as abundant in lawns generally over the State.

Minnesota. C. Lyle (May 22): Ants in many forms are very abundant.

Nebraska. M. H. Swenk (May 20): Complaints of peonies being infested with ants were received from Dawson, Greeley, and Redwillow Counties. From Frontier County came the complaint of the common harvester ant (Pogonomyrmex occidentalis Cress.) working in a garden.

#### PEA WEEVIL (Bruchus pisorum L.)

North Dakota. J. A. Munro (May 18): An infestation of pea weevil in stored seed peas at Leith, Grant County, was found on April 11.

California. R. E. Campbeel (May 14): Adults were numerous in a field of cannery peas in Marin County. In numerous small pods, some of them not more than 2 inches long, it was difficult to find a single pod on which there were no eggs, and many of them had 10 or 12.

#### BROWN SPIDER BEETLE (Ptinus brunneus Duft.)

Connecticut. W. E. Britton (May 19): Millions of these beetles were reported as infesting grain and grain bags in New Britain.

Ohio. T. H. Parks (May 19): Specimens were received from Ross and Auglaize Counties with the statement that they were infesting houses.

#### LARDER BEETLE (Dermestes lardarius L.)

Minnesota. A. G. Ruggles (May 22): The larder beetle is abundant on meat at Saint Charles in Winona County.

#### ANGOUNOIS GRAIN MOTH (Sitotroga cerealella Oliv.)

Indiana. J. J. Davis (May 23): More than the usual number of inquiries have been received regarding infestation of Angoumois grain moth in seed corn and popcorn. Most of the inquiries refer to corn held over the second year in the southern half of the State.

## RESULTS OF EUROPEAN CORN BORER SURVEYS IN THIRTEEN SELECTED COUNTIES, 1935

By L. H. Worthley, In Charge,  
Japanese Beetle Control Division,  
Bureau of Entomology and Plant Quarantine,  
U. S. Department of Agriculture.

Results of a survey to determine the degree of European corn borer infestation over a considerable portion of the infested area were reported by A. M. Vance, of the Division of Cereal and Forage Insect Investigations, in the Insect Pest Survey Bulletin vol. 15, supplement to no. 9 (October 1935).

As a part of a corn borer survey performed by men employed under Works Progress Administration funds, working under the supervision of the Japanese Beetle Control Division, surveys were made in 13 counties in Maine, Michigan, New Hampshire, New Jersey, and Vermont that were not covered by the survey organized by the Division of Cereal and Forage Insect Investigations.

In general, the W. P. A. survey was made in fields selected at random in each township of the counties covered. Twenty-five consecutive corn plants in one row near the center of each quarter of the field were examined for infestation, a total of 100 plants being examined in each field. Ten of the plants showing infestation were dissected to determine the average number of corn borers per infested plant.

Data concerning the 13 nonduplicated counties supplement that previously reported, and are tabulated for the information of interested State officials.

Townships in the respective counties surveyed are listed, together with the number of fields examined, acres surveyed, percentage of plants found infested, and the average number of corn borers per 100 plants examined. County summaries are included. There are, however, no regional averages, as these data are incomplete for continuous areas, and must be considered in conjunction with previously published results if regional averages are desired.

Data on infestation of European corn borer in the fall of 1935 in  
13 selected counties.

One-generation area

MICHIGAN

Cass County

Township	Fields examined	Area surveyed	Plants infested	Average borers per 100 plants
	Number	Acres	Percent	Number
Calvin.....	5	105	0.0	0.0
Jefferson.....	5	50	.0	.0
La Grange.....	5	106	.8	1.6
Marcellus.....	5	74	4.6	4.8
Mason.....	5	58	.2	.0
Newberg.....	5	61	5.4	7.8
Volinia.....	5	64	11.8	62.2
Total .....	35	518	—	—
Average.....	-	-	3.3	10.9

Ottawa County

Chester.....	5	43.0	2.8	1.6
Georgetown.....	5	25.0	2.2	1.6
Jamestown .....	5	25.5	.4	.0
Talmadge .....	5	29.5	2.2	1.0
Wright .....	5	26.5	1.8	2.6
Total.....	25	149.5	—	—
Average.....	-	-	1.9	1.4

VERMONT

Windham County

Township	Fields examined	Area surveyed	Plants infested	Average borers per 100 plants
	Number	Acres	Percent	Number
Athens.....	5	16.0	3.2	3.0
Brattleboro.....	5	31.0	4.6	10.4
Brookline .....	5	25.0	3.8	2.6
Dover .....	5	8.5	3.6	6.0
Dummerston .....	5	23.0	5.4	8.6



One-generation area (Continued)

VERMONT(Continued)

Windham County (Continued)

Township	Fields examined <u>Number</u>	Area surveyed <u>Acres</u>	Plants infested <u>Percent</u>	Average borers per 100 plants <u>Number</u>
Grafton.....	5	17.0	9.8	19.7
Guilford.....	5	11.0	1.8	2.8
Halifax.....	5	8.0	3.0	6.6
Jamaica.....	5	9.0	5.8	7.2
Londonderry.....	5	16.5	.4	.4
Marlboro.....	5	16.5	3.0	2.4
Newfane.....	5	15.0	.6	.0
Putney.....	5	42.0	6.8	12.8
Rockingham.....	5	43.5	15.2	59.8
Somerset.....	1	.1	.0	.0
Stratton.....	5	3.6	2.0	2.2
Townsend.....	5	32.0	6.0	5.4
Vernon.....	5	29.5	.6	.8
Wardsboro.....	5	10.0	3.4	3.6
Westminster.....	5	22.0	8.2	19.0
Whitingham.....	5	13.0	4.0	6.5
Wilmington.....	5	9.5	2.8	3.2
Windham.....	5	8.5	3.4	2.2
Total.....	111	410.2		
Average....	-	-	4.2	8.0

MAINE

Two-generation area

Androscoggin County

Township	Fields examined <u>Number</u>	Area surveyed <u>Acres</u>	Plants infested <u>Percent</u>	Average borers per 100 plants <u>Number</u>
Auburn.....	5	17.5	0.6	0.6
Durham.....	5	7.7	.0	.0
East Livermore....	5	6.5	.0	.0
Greene.....	5	12.2	.2	.2
Leeds.....	5	12.7	.0	.0
Lewiston.....	5	13.5	.0	.0
Lisbon.....	5	12.7	.0	.0
Livermore.....	5	6.5	.0	.0
Mechanic Falls....	5	12.7	.0	.0
Minot.....	5	8.5	.0	.0

Two-generation area (Continued)

MAINE (Continued)

Androscoggin County (Continued)

Township	Fields examined	Area surveyed	Plants infested	Average borers per 100 plants
	Number	Acres	Percent	Number
Poland.....	5	14.0	.0	.0
Turner.....	5	6.7	.0	.0
Wales.....	5	9.0	.0	.0
Webster.....	5	14.5	.0	.0
Total.....	70	154.7		
Average..	-	-	.06	.06

Cumberland County

Baldwin.....	5	5.3	0.6	0.4
Bridgton.....	5	7.3	2.0	1.8
Brunswick.....	5	2.5	6.0	13.5
Cape Elizabeth....	5	5.5	6.8	11.0
Casco.....	5	7.0	.4	.6
Cumberland.....	5	2.6	1.8	2.4
Falmouth.....	5	2.6	6.4	14.8
Freeport.....	5	12.5	2.8	.4
Gorham.....	5	14.5	2.2	3.2
Gray.....	5	19.0	.4	.6
Harpwell.....	5	4.7	2.2	1.2
Harrison.....	5	9.2	.2	.4
Naples.....	5	6.5	.4	.4
New Gloucester....	5	10.0	.8	.6
North Yarmouth....	5	7.7	3.8	4.0
Otisfield.....	5	13.0	.0	.0
Portland.....	5	5.2	9.4	20.0
Pownal.....	5	16.0	.6	.4
Raymond.....	5	8.7	.0	.0
Scarboro.....	5	3.7	4.6	4.6
Sebago.....	5	5.0	.0	.0
South Portland....	5	.5	9.6	11.0
Standish.....	5	10.0	.6	.8
Westbrook.....	5	1.3	6.4	10.8
Windham.....	5	10.0	.4	.0
Yarmouth.....	5	2.0	6.2	12.0
Total.....	130	192.3		
Average...	-	-	2.9	4.4

Two-generation area (Continued)

NEW HAMPSHIRE

Hillsboro County

Township	Fields examined Number	Area surveyed Acres	Plants infested Percent	Average borers per 100 plants Number
Amherst.....	5	17.5	4.8	1.4
Antrim.....	5	12.5	1.2	1.4
Bedford.....	5	12.7	6.8	14.2
Bennington.....	5	12.7	3.3	3.4
Brookline.....	5	5.5	7.4	17.6
Deering.....	5	19.5	.6	.2
Francestown.....	5	17.0	1.6	2.2
Goffstown.....	5	9.0	5.0	10.6
Greenfield.....	5	4.7	3.0	4.2
Greenville.....	5	19.0	4.8	7.2
Hancock.....	5	19.5	.8	2.2
Hillsborough.....	5	14.2	3.2	3.0
Hollis.....	5	6.0	8.2	38.2
Hudson.....	5	7.2	9.0	21.4
Litchfield.....	5	11.5	6.4	8.2
Lyndeboro.....	5	12.2	.8	1.0
Manchester.....	5	20.0	7.8	15.0
Mason.....	5	3.5	9.0	22.8
Merrimack.....	5	12.2	4.8	7.0
Milford.....	5	8.2	6.8	16.8
Mt. Vernon.....	5	2.8	6.8	16.5
Nashua.....	5	9.5	2.2	2.2
New Boston.....	5	9.7	1.8	2.8
New Ipswich.....	5	5.7	.2	.2
Pelham.....	5	14.0	8.0	18.2
Petersboro.....	5	8.2	3.0	5.2
Sharon.....	5	3.2	.0	.0
Temple.....	5	9.2	.0	.0
Weare.....	5	23.5	.8	.8
Wilton.....	5	6.0	4.8	8.5
Windsor.....	5	3.2	1.2	1.2
Total.....	155	339.6	—	—
Average...	-	-	4.0	8.2



Two-generation area (Continued)

NEW HAMPSHIRE (Continued)

Merrimack County

Township	Fields examined Number	Area surveyed Acres	Plants Infested Percent	Average borers per 100 plants Number
Allentown.....	5	6.5	8.0	36.2
Andover.....	5	16.0	1.4	3.8
Boscawen.....	5	21.0	5.0	4.1
Bow.....	5	16.2	8.2	42.0
Bradford.....	5	5.2	3.0	5.0
Canterbury.....	5	18.5	1.2	3.8
Chichester.....	5	12.7	3.2	5.6
Concord.....	5	26.5	5.0	8.4
Danbury.....	5	10.2	.8	1.4
Dunbarton.....	5	17.2	4.1	8.8
Epsom.....	5	7.5	4.6	9.4
Franklin.....	5	8.0	2.4	3.0
Hill.....	5	16.5	12.2	12.6
Hooksett.....	5	15.0	9.0	36.5
Hopkinton.....	5	8.7	3.2	9.6
London.....	5	12.0	1.8	2.0
Newbury.....	5	9.2	2.6	5.2
New London.....	5	16.7	3.0	1.4
Northfield.....	5	6.5	2.8	4.2
Pembroke.....	5	10.7	7.2	21.0
Pittsfield.....	5	16.5	6.2	13.4
Salisbury.....	5	6.0	.6	.8
Sutton.....	5	9.2	4.4	12.5
Warner.....	5	22.0	3.6	6.5
Webster.....	5	11.0	2.3	4.3
Wilmot.....	5	11.5	4.3	10.6
Total.....	130	337.0	—	—
Average....	-	-	4.2	10.5

Two-generation area (Continued)

## NEW JERSEY

Bergen County

Township	Fields examined	Area surveyed	Plants infested	Average borers per 100 plants
	Number	Acres	Percent	Number
New Milford.....	5	4.2	46.8	94.6
Riverdale.....	5	11.3	13.2	20.3
Total.....	10	15.5	—	—
Average.....	—	—	30.0	57.4

Cape May County

Dennis.....	5	5.2	5.0	5.2
Lower.....	5	17.3	21.0	45.5
Middle.....	5	6.9	11.4	15.4
North End.....	5	6.7	6.8	6.4
Total.....	20	36.1	—	—
Average.....	—	—	11.0	18.1

Hunterdon County

Holland.....	3	30.5	4.0	1.6
Total.....	3	30.5	—	—
Average.....	—	—	4.0	1.6

Middlesex County

E. Brunswick.....	5	27.0	8.2	5.6
Helmetta.....	2	2.0	8.0	6.5
Madison.....	5	7.5	12.2	11.1
Monroe.....	5	18.5	11.0	12.3
N. Brunswick.....	5	10.0	.0	.0
Sayerville.....	4	3.0	6.0	4.0
Spotswood.....	4	5.5	7.0	3.7
Woodbridge.....	4	2.0	3.2	2.7
Total.....	34	75.5	—	—
Average.....	—	—	6.9	5.7

Two-generation area (Continued)

NEW JERSEY (Continued)

Morris County

Township	Fields examined Number	Area surveyed Acres	Plants infested Percent	Average borers per 100 plants Number
Hanover.....	5	2.5	0.0	0.0
Chatham.....	5	17.2	.0	.0
Jefferson.....	5	8.1	.2	.2
Morris.....	5	3.7	.4	1.8
Morris Plains.....	5	5.4	.2	.2
Total.....	25	36.9	—	—
Average.....	-	-	0.2	0.4

Warren County

Franklin.....	5	52.0	40.2	57.7
Frelinghuysen.....	5	41.0	2.6	1.6
Greenwich.....	5	83.0	34.4	45.2
Harmony.....	5	59.5	37.2	39.5
Independence.....	5	27.0	2.6	2.0
Lopatcong.....	5	61.0	29.0	36.8
Mansfield.....	5	41.0	6.0	4.3
Pohatcong.....	5	59.0	29.0	31.0
Washington.....	5	67.0	15.2	14.4
White.....	5	73.0	3.6	2.6
Total.....	50	563.5	—	—
Average.....	-	-	20.0	23.5



## THE MORE IMPORTANT RECORDS FOR JUNE 1936

The occurrence of grasshopper outbreaks in the Central and Western States is probably the most serious insect problem that developed during the month. Grasshoppers were reported in destructive numbers from Michigan and northwestern Indiana, westward through the northern two-thirds of Illinois to the Great Plains States, including eastern Colorado, and southward to Arkansas and Oklahoma. The most seriously infested States are Iowa, Nebraska, Kansas, Oklahoma, and Colorado. The general and widespread occurrence of these outbreaks prompted Congress to appropriate \$250,000 to enable the Bureau to cooperate with States in a campaign for control. Serious grasshopper trouble was reported also from Utah and north-central California.

Cutworms were especially abundant throughout the greater part of the country during the early part of June. Many species were involved.

Scattered reports of serious wireworm injury were reported along the South Atlantic States and into the Gulf Region, with similar reports coming from the Mississippi Valley and the Great Basin.

Throughout the New England States and westward to Michigan, rose chafers did considerable damage to flower gardens and fruit, with occasional reports of young poultry being killed from eating the beetles.

Rather heavy infestations of wheat by hessian fly were reported from New York westward to Iowa; however, little commercial damage was reported over most of the region.

Although the chinch bug was reported as somewhat abundant from Virginia westward to Nebraska and Oklahoma, little damage was reported in the eastern part of this region. Some damage was reported from eastern Iowa, Nebraska, Kansas, and Oklahoma. A small localized outbreak of this insect also occurred in Northampton County, Va.

The stalk borer was unusually abundant from Indiana westward to Minnesota and Kansas, the larvae damaging principally corn and tomatoes.

In the southern Mississippi Valley from Tennessee to the northern half of Mississippi damage by the sugarcane beetle to corn was reported.

From the Hudson River Valley of New York southward to Virginia and West Virginia the rose leaf beetle was probably the most serious pest to flower gardens and berry crops.

Codling moth entering fruit was reported quite generally over the Middle Atlantic and East Central States during the latter half of the month and, although generally reported as having suffered high mortality during the winter, populations were increasing rapidly.

Eastern tent caterpillar was reported as quite numerous throughout the New England and Middle Atlantic States. The peak was apparently reached last year and this year the outbreak seems to be on the wane.

Apple curculio occurred in outbreak numbers in parts of Ohio, Indiana, and Missouri.

Plum curculio caused more damage than usual throughout the New England States, New York, and westward to Indiana. Severe drought in the Fort Valley section of Georgia delayed emergence of the adults, so that no trouble is anticipated to peach varieties that ripen before the Elbertas.

Damage by oriental fruit moth is reported from the New England States southward to Virginia along the Atlantic Seaboard and westward to Illinois and thence down the Mississippi Valley to the Gulf States. In the East Central and Gulf States infestations were heavier than usual.

From Massachusetts to Ohio, particularly in the Lake Region, the grape plume moth did considerable damage.

An outbreak of the false chinch bug occurred from Michigan westward to Nebraska, the principal damage being done to strawberries, although a number of other crops were attacked. In California this insect damaged grapes.

Several species of flea beetles were very numerous on truck crops from New York westward to Nebraska on the north and Missouri on the south, with similar trouble reported from Utah and Washington.

The Mexican bean beetle was reported as less abundant than usual in the Ohio Valley and Northeastern States. Late in the month, however, the insect began to appear in destructive numbers over much of this territory.

Heavy infestations of pea aphid were reported from New York to Wisconsin, with damage also reported from Kansas, Mississippi, and Utah.

Heavy infestations of cabbage by the imported cabbage worm were reported from Pennsylvania and Virginia, westward to Missouri. Much early cabbage was also damaged in this region by the cabbage aphid.

The first record of serious damage to celery by the parsley stalk weevil in New Jersey was reported this month.

From Wisconsin and Tennessee westward to Nebraska and Kansas strawberry leaf roller was a major pest of strawberries.

Cankerworms occurred in unusual numbers throughout New England, the Middle Atlantic, and East Central States, westward to Iowa and Nebraska. Severe



infestations by forest tent caterpillars were occurring over this same territory, but extending westward only to Minnesota.

The elm leaf beetle was quite prevalent in the New England and Middle Atlantic States, with unusual damage in the East Central States and localized outbreaks in Idaho and California.

European elm scale was generally prevalent from New York to Iowa.

#### THE MORE IMPORTANT FEATURES IN CANADA IN MAY AND JUNE 1936

The grasshopper outbreak in the Prairie Provinces, which has been widespread, serious, and menacing since 1930, was greatly reduced during 1935 by weather conditions, natural enemies, and the effects of organized intensive control campaigns. Indications this spring point to still further reduction. Hatching in Manitoba was slow and irregular and no damage has been observed, so far, except in the southwest, where dry conditions caused some trouble from grasshoppers. In Saskatchewan hatching began the middle of May, but up to the middle of June, the infestation in southern areas was very light and no severe damage had been done. The insects were generally abundant west of Saskatoon, but damage has been minimized by cool weather, heavy rains, and the distribution of poisoned bait. In Alberta slight losses to crops were occurring in drier areas late in June, but these were being held in check by the poisoning campaign. A moderately widespread outbreak of grasshoppers has developed in sandy regions of Renfrew and Hastings Counties in eastern Ontario.

Cutworms of several species were reported to be unusually abundant and causing damage to garden, truck, and field crops in parts of every province in the Dominion. A resurgence of these insects occurred in many parts of Canada in 1935. The pale western cutworm is in serious outbreak form in southern Alberta, causing severe losses to grain crops in some areas. Quite severe damage was reported also in sections of Saskatchewan. A considerable outbreak of the red-backed cutworm was reported through much of the northern and east-central part of the Park Belt in Saskatchewan, with resultant damage to field and garden crops. It caused local damage in gardens in southern Manitoba.

Wireworms are proving to be the most serious pest of the year in medium- and light-soil areas of prairie and open-park sections of Saskatchewan. Losses to wheat seeded in summerfallow quite generally ranged from 10 to 50 percent. Infestations have increased markedly in recent years, particularly in idle fields and in districts affected by drought and soil drifting. Infestations are general in many areas of southern Alberta, with damage slight to severe. Wireworms were reported as destructive to grain and other crops locally in southwestern Ontario.

A major flight of June beetles occurred in southern Quebec and much



foliage injury was done to a variety of deciduous trees and shrubs. In sandy and sandy-loam sections of eastern Ontario white grubs were abundant and causing damage to timothy sod.

Heavy infestations of the red turnip beetle have occurred on cruciferous garden plants and weeds in Saskatchewan, west and northwest of Saskatoon, to the Alberta boundary.

For the first time since 1923, material damage to wheat by the western chinch bug was reported in the locality of Madison, in western Saskatchewan. The infestation may be more widespread than indicated by this report.

Crop damage by flea beetles of various species is reported to be widespread in the Dominion.

Large flights of the beet webworm occurred in the three Prairie Provinces, and damage to sugar beets by the larvae is threatened in beet-growing areas.

Injury by the cabbage maggot was reported severe in southwestern Ontario and in the Okanagan Valley, British Columbia.

Orchard insects are generally well under control in the Annapolis Valley, Nova Scotia, but the rosy apple aphid has appeared in injurious numbers in many districts. The green apple bug is also more prevalent than for several years past.

The strawberry weevil was abundant and injurious to strawberries in parts of the Annapolis Valley, Nova Scotia, and on Prince Edward Island.

In the Niagara district, Ontario, weather conditions so far have been unfavorable to the development of the codling moth and oriental fruit moth. Grape leafhoppers are again present in injurious numbers in this district.

Overwintering tarnished plant bugs have caused serious damage in many apple orchards of the Vernon district, British Columbia, by destroying the buds.

Trees and shrubs in many parts of the Dominion again suffered foliage injury from the attacks of tent caterpillars. The eastern tent caterpillar caused defoliation of neglected orchards in sections of eastern Canada. A major outbreak of the forest tent caterpillar developed in Ontario over a wide region north of the Georgian Bay and Lake Superior. Deciduous trees and shrubs were defoliated, houses and gardens were invaded, and trains were delayed during the course of the outbreak, which occasioned much newspaper publicity and considerable public concern. Tent caterpillars were also reported to be unusually numerous in British Columbia.

An extensive outbreak of the jackpine sawfly, apparently Diprion swainei Middleton, is in progress in the Abitibi Lake region of Ontario. A European species, D. frugiperum Fab., found attacking pine in the Niagara district in 1934, shows no further spread and is being brought under control in some areas by imported parasites.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- North Carolina. C. H. Brannon (June 25): Grasshoppers are seriously damaging tobacco in many parts of the State.
- Indiana. J. J. Davis (June 22): Grasshoppers (specimens examined are Melanoplus mexicanus Sauss.) have been more abundant throughout the State than for many years. Damage was reported June 14 in St. Joseph and Elkhart Counties. Since that time reports have been received from several other northern counties and in Tippecanoe and Vermillion Counties. In most cases they are breeding in alfalfa fields, completely stripping the alfalfa and migrating to wheat, soybeans, cowpeas, and corn. At present most of them are mature.
- Illinois. W. P. Flint (June 22): Heavy infestations of grasshoppers are developing locally throughout the northern three-fourths of the State. The infested areas are not large, running from 10 to several hundred acres; in a few cases to a thousand acres or more. The poison bait has been used very successfully.
- Michigan. R. Hutson (June 25): Reports of damage have been received from Vandalia, Cass County, and Hanover, Jackson County. These points are below the generally infested area revealed in the survey last fall.
- Wisconsin. E. L. Chambers (June 24): For the first time on record, extremely heavy infestations of grasshoppers are occurring in southern Wisconsin, but are mostly limited to areas of one or two townships. M. mexicanus is nearly mature and is cleaning up crops over large areas. Camnula pellucida Scudd. hoppers have recently hatched. Active control work is being carried on in Douglas, St. Croix, Dunn, Chippewa, Shawano, Langlade, Columbia, Rock, Dane, Green, Jefferson, and Portage Counties.
- Minnesota. A. G. Ruggles (June 20): Grasshoppers scarce except in two townships in Todd County, in central Minnesota, where they are abundant.
- Iowa. C. J. Drake (June 24): The grasshopper situation is very serious in western and southwestern Iowa. In about 10 counties it now appears that they will destroy at least half of the grain and most of the alfalfa. Over 70 carloads of poison bait have been used, and an effort is being made to obtain 250 more cars. In some of the most heavily infested small grain and alfalfa fields the population ranges from 50 to 200 grasshoppers per square yard. The infestation in the southern half of the State is very spotted. The lesser migratory locust (M. mexicanus) and the two-lined grasshopper (M. bivittatus Say) are the most abundant species, many of which are in the adult state. The differential grasshopper (M. differentialis Thos.) is also very abundant in many localities but did not hatch as early as the other two species.



Missouri. L. Hoseman (June 24): The red-legged grasshopper (M. femur-rubrum DeG.) is rapidly maturing, while the differential species is still largely in the nymph stage. In central Missouri there are unbelievable numbers of the Carolina locust (Dissosteira carolina L.) mingled with the two harmful species. Practically every section of Missouri is infested with hoppers and, with the shortage of rainfall, they are already doing serious damage to cultivated crops in some areas.  
Correction.-- The note on Schistocerca americana Drury in Missouri in the Bulletin, June 1, 1936, page 98, should read D. carolina.

Arkansas. D. Isely (June 24): Grasshoppers are unusually abundant in north-eastern Arkansas, where a considerable acreage of alfalfa is grown. The hoppers are now reported as leaving alfalfa and migrating to corn and cotton.

North Dakota. F. Gray Butcher (June): Grasshoppers have been reported as very abundant in 11 counties and moderately abundant in 13 counties. Some crop injury has occurred in isolated spots, and in such communities considerable quantities of bait have been spread. However, generally over the areas of heavy infestation severe drought has so reduced crop prospects that the farmers are not distributing bait in sufficient quantities to obtain control.

South Dakota. H. C. Severin (June 20): Grasshoppers are more numerous on range and pasture land than they have been during the past 25 years. The ranges and pastures are drying up and the hoppers are moving into what is left of the cultivated crops. The extreme eastern and the extreme southern edge still have a chance for a crop, but even in some of this territory the hoppers are abundant. Some species are already migrating. Many Pardalophora haldemanni Scudd. are attracted to electric lights.

Nebraska. M. H. Swenk (June 20): A survey of the adult population and egg infestation made in 74 counties in September and October 1935 showed that many eggs had been laid in practically all of the counties bordering on the Missouri River, the southern border of the State, and in the western part of the State. The eggs overwintered with low mortality and about May 6 (nearly a fortnight later than normal) they began to hatch all over eastern Nebraska. They continued to hatch out over the State in large numbers during the greater part of May and before the end of that month it was very evident that an extensive and serious outbreak was at hand, rivalling in a number of localities the outbreak of 1934, if not exceeding it. Up to June 20, serious damage has been reported in 46 counties. Between these counties the intensity of the infestation varies greatly, but everywhere serious crop damage is taking place, not only in gardens but in fields of corn and small grains, and especially in fields of young alfalfa. The outlook is very threatening and heavy losses in many counties are probable.



Kansas. H. R. Bryson (June 26): Grasshoppers are very abundant generally, but are causing more damage in the eastern half of the State. In many alfalfa fields the new shoots for the second crop of hay have been seriously damaged. The harvest of the small grains has forced the hoppers to adjoining greener vegetation, usually corn, soybeans, and alfalfa. Early in June adults of M. mexicanus were found and on June 12, adults of M. bivittatus were found in the field at Manhattan. These dates are much earlier than usual for the appearance of the adults of these species. The grasshoppers in many of the fields near Manhattan are heavily parasitized by Sarcophaga kellyi Ald.

Oklahoma. F. A. Fenton (June 23): A very serious outbreak of grasshoppers has developed in Osage, Pawnee, Noble, Payne, Nowata, Lincoln, and Pottawatomie Counties. The infestation is spotted but increasing in 19 other counties in western and northwestern Oklahoma. It is quite likely that the infestations exist in all of the counties of the State, but the outbreak seems to be more serious in the northeastern part. A number of species are involved but M. mexicanus is most prevalent, with M. femur-rubrum next. On the night of June 9 a third species was attracted to lights in a number of cities in the central and northeastern parts of the State, appearing in Bartlesville at about 9 o'clock in the evening and at Stillwater at about 11. Literally thousands of them were blown in by a cold north wind. This species has been tentatively identified as P. halldemani. At present the outbreak is steadily increasing, following the harvest of small grains and cotton, alfalfa, and Irish potatoes--in fact, all growing crops are being seriously damaged or destroyed.

Mississippi. C. Lyle (June 25): M. differentialis was attacking 400 acres of cotton at Sardis on May 28. A prompt application of poisoned bran quickly controlled the infestation.

Utah. G. F. Knowlton (June 11): Seagulls in great numbers were observed following the mowing machine at Benson, eating all of the larger grasshoppers as soon as the alfalfa was cut. In Utah County hoppers are very abundant in the foothills surrounding the farm area at Genola. Adults of Elliott's locust (Aulocara ellioti Scudd.) and Trimerotropus vinculata Scudd. are most abundant at this time. Considerable injury to farm crops is anticipated.

California. S. Lockwood (June 12): C. pellucida, M. devastator Scudd., and Oedaleonotus enigma Scudd. are very abundant in Tehama, Yuba, Yolo, Sacramento, San Joaquin, Mariposa, Tulare, and Calaveras Counties. Control campaigns are under way and the damage has been confined largely to native grasses.

#### EASTERN LUBBER GRASSHOPPER (Romalea microptera Bdv.)

Florida. J. R. Watson (June 22): In Clay County there was a heavy infestation of the lubberly locust. The damage was mostly to summer cover crops, such as cowpeas, but watermelons, cantaloupes, corn, beans, and okra were considerably damaged.

MORMON CRICKET (Anabrus simplex Hald.)

South Dakota. H. C. Severin (June): Mormon crickets have been sent in from 6 localities in western and central South Dakota. In no instance, however, have the crickets occurred in sufficient numbers to warrant control measures.

Utah. C. J. Sorenson (June 19): Mormon crickets have been reported from Uintah County and 5 miles west of Paradise in Cache County.

CUTWORMS (Noctuidae)

Massachusetts. A. I. Bourne (June 25): On May 18 our attention was called to very severe damage by cutworms attacking fields of set onions in Hampshire County. One farm had at least 2 acres so badly damaged that it was a question of whether the crop would be worth carrying through.

Connecticut. W. E. Britton (June): Cutworms are present in vegetable crops in the usual numbers and have caused the usual amount of damage throughout the State.

Indiana. J. J. Davis (June 22): The overflow worm (Agrotis ypsilon Rott.) was abundant in bottom land along the Wabash River, from Clinton south, and along the Ohio River near Evansville.

Wisconsin. C. L. Fluke (June 20): Lined cornstalk borer (Oligia fractilinea Grote) has been found infesting young corn in Brown County.

E. L. Chambers (June 24): Severe cutworm outbreaks have been observed on light, sandy soil throughout the State. Many fields of corn had to be replanted where control measures were not practical. Severe damage was reported to tobacco, garden crops, small grain, and corn during the first 2 weeks of June. About a dozen counties in the central part of the State were supplied with poison for control campaigns.

Minnesota. A. G. Ruggles (June 20): Cutworms are moderately abundant.

North Dakota. F. Gray Butcher (June): Pale western cutworms (Porosagrotis orthogonia Morr.) have been causing considerable damage to cereal crops in the western portion of the State, especially in Burleigh, Morton, Stark, and Burke Counties. There have been several reports of almost complete destruction of large acreages of wheat and other crops. Recent observations indicate that the larvae are practically full grown and further extensive injury is not anticipated.

South Dakota. H. C. Severin (June 20): Cutworm damage was more severe this year than normally. The damage is about over at the present time.

Nebraska. M. H. Swenk (June 20): On May 21 and June 7, respectively, from Hooker and Morrill Counties came reports of the presence of enormous numbers of millers of Chorizagrotis auxiliaris Grote. The variegated



cutworm (Lycophotia margaritosa saucia Hbn.) was defoliating tomato plants in Lancaster County on June 2, stripping gardens in Webster County on June 9, and cutting off pea vines in Loup County on June 11. Cutworm damage was reported from Thurston, Madison, Lancaster, and Cheyenne Counties from May 21 to June 20. In Thurston and Lancaster Counties the worms (A. ypsilon) were cutting the corn below the surface of the ground. The dark-sided cutworm (Euxoa messoria Harr.) was found injuring tomato plants in Lancaster County and potatoes in Knox County.

Mississippi. C. Lyle (June 25): Prodenia ornithogalli Guen. was reported in Leaned in cotton and on gladiolus at Ridgeland on May 22.

Utah. G. F. Knowlton (June 6): Cutworms seriously damaged bean patches at Granite and Butlerville in Salt Lake County.

#### ARMYWORM (Cirphis unipuncta Haw. et al.)

Iowa. C. J. Drake (June 24): Armyworms are doing a considerable amount of damage in Fremont County. One 40-acre field of wheat was totally destroyed.

Nebraska. M. H. Swenk (June): In Lancaster County, during the third week in June the true armyworm was damaging wheat heads in a few instances.

Oklahoma. C. F. Stiles (June 22): Armyworms of undetermined species are reported damaging cotton in Canadian County.

#### A CABBAGE BUTTERFLY (Pontia monuste L.)

Florida. H. T. Fernald (June 18): The flight this spring appears to have begun about May 10. The butterflies were extremely abundant near New Smyrna on the 10th and by the 14th had appeared at Daytona Beach (west side of Halifax River), but had disappeared on the 16th. On the 19th they appeared on the outer beach on the half-mile-wide key between the river and the ocean, and were continuing on the 24th. All were going north. On June 4 they were very abundant from Indian River City south to Cocoa, flying in a southerly direction.

#### A TIGER MOTH (Apantesis sp.)

Mississippi. C. Lyle (June 25): An unusual outbreak of Apantesis sp. has occurred in Oktibbeha and Clay Counties. The last previous record was in 1925. The worms were moving out of pastures and destroying adjacent cotton.

#### WIREWORMS (Elateridae)

North Carolina. C. H. Brannon (June 10): Wireworms are seriously damaging corn in Carteret County and peanuts in Chowan County.

South Carolina. W. J. Reid and C. O. Bare (June 1-8): In the spring of 1936 wireworms (Heteroderes laurentii Guer., and other species) were again



injurious to the early potato crop of the coastal area. An examination at harvest of 3,023 tubers taken from four fields in the vicinity of Charleston showed that 41 percent of them had been injured by wireworms.

F. F. Bondy and C. F. Rainwater (June): Wireworms (Melanotus sp. and Aeolus sp.) are more abundant than usual on cotton at Florence, and have reduced the stand in some places, especially where corn was grown last year.

Georgia. O. I. Snapp (June 19): J. R. Thomson reports that adults of Mono-  
crepidius vespertinus Fab. appear to be more abundant than usual in peach orchards at Fort Valley.

Indiana. P. Luginbill (June 10): Several fields of corn near Dolphi injured by wireworms, probably Drasterius sp.

Kentucky. W. A. Price (June 25): Wireworms have been destructive to corn and tobacco plants at La Grange, Greenville, and Springfield.

Wisconsin. E. L. Chambers (June 24): Considerable damage to tobacco, corn, and garden crops is being reported from various points in the State.

Missouri. L. Haseman (June 24): We have not had the usual June complaints against wireworms, but a great many farmers are having difficulty with them in patches, particularly in lowlands.

Mississippi. C. Lyle (June 25): Several fields of cotton and corn were being damaged at Morgantown on June 15 by larvae of the sand wireworm (Horis-  
tonotus uhlerii Horn). The damage was principally in spots scattered over the fields.

Idaho. R. W. Haagele (June 15): Wireworms are somewhat more damaging than usual, feeding heavily during May on early planted crops such as wheat, corn, and onions. Later plantings, especially of corn were also injured, as the wireworm feeding extended well into June.

Utah. G. F. Knowlton (June 6): Wireworms are damaging young sugar beets and tomatoes in a few fields at Lewiston.

#### WHITE GRUBS (Phyllophaga spp.)

Pennsylvania. K. Hower (May 29): A beetle has been appearing around Midville in great swarms. (Identified by E. A. Chapin as P. tristis Fab.)

Georgia. O. I. Snapp (June 16): Not so abundant as usual at this time of the year at Fort Valley. A number have been taken from soil under the spread of peach trees, the foliage of which they attacked during the night.

J. M. Robinson (June 2): The brown June bug (P. micans Knoch) has been attacking pecan and white oak trees in groves that have not been

cultivated, and in groves on the uplands near West Point. The beetles were very active the last week of April and the first week of May.

Indiana. J. J. Davis (June 22): White grubs were reported to be heavily infesting lawns at Culver on June 17.

Wisconsin. E. L. Chambers (June 24): Unusually heavy flights of P. tristis were observed throughout the southern part of the State during the latter part of May and the first week of June. Many reports are being received from the counties of the central part of the State, stating that serious damage is being done to strawberry, potatoes, and gardens.

Iowa. C. J. Drake (June 24): Damage by white grubs, brood A, is beginning to show up in cornfields. The infestation is very widespread and extends beyond the eastern half of the State.

#### JAPANESE BEETLE (Popillia japonica Newm.)

Delaware. L. A. Stearns (June 15): First adults of the Japanese beetle were observed at Newark today.

Pennsylvania. H. E. Hodgkiss (June 23): Adults were beginning to appear during the week of June 15 in the Philadelphia area.

Washington, D. C., and Maryland. B. A. Porter (June 30): Adults of the Japanese beetle are being reported from the District of Columbia and nearby Maryland.

#### A SCARABAEID (Ochrosidia immaculata Oliv.)

Kentucky. W. A. Price (June 25): Pupation began the last week in May and continued through the second week in June. The first adult was taken on June 7 at a light. A heavy flight of this insect is expected soon in the vicinity of Lexington.

#### ROSE CHAFER (Macrodactylus subspinosus Fab.)

Maine. H. B. Peirson (June 21): Heavy outbreaks of rose chafers reported from Augusta, Portland, and Wayne, where the beetles were attacking fruit and foliage of apple.

Vermont. H. L. Bailey (June 18): Rose chafers very abundant generally on June 15. Serious problem at Milton, where many young pheasants were killed by eating the beetles.

Massachusetts. A. I. Bourne (June 25): Rose chafer appeared during the week of June 5 to 7, and from all indications it is about as abundant as usual.

Connecticut. E. P. Felt (June 24): The rose chafer has been somewhat abundant in the Stamford area.

New York. R. E. Harsey (June 10): A few rose chafers on peony and rose flowers at Rochester. No noticeable damage.

N. Y. State Coll. Agr. News Letter (June): Rose chafers are very abundant and injurious in orchards in the Hudson River Valley and in western New York.

Michigan. R. Hutson (June 20): Rose chafers have been reported as damaging grapes and peaches in Berrien, Ottawa, Van Buren, Clinton, Shiawassee, Oceana, Genesee, Kalamazoo, Sanilac, Montcalm, Isabella, and Saint Clair Counties.

COMMON RED SPIDER (Tetranychus telarius L.)

Georgia. T. L. Bissell (June 6): The red spider is very abundant on and injurious to oak trees at Experiment. The mites are working on the upper surfaces of the leaves.

Ohio. E. W. Mendenhall (June 10): The red spider is very abundant on arbovitae stock in the nursery at Xenia, causing some damage.

Kentucky. W. A. Price (June 25): Red spiders are common and destructive over the State generally.

Tennessee. G. M. Bentley (June 20): Red spider is present generally over the State, attacking a large variety of ornamentals. We have had several complaints of its attacking boxwood.

Missouri and Kansas. H. Baker (June 24): The common red spider, which has been a serious pest in apple orchards in this section the last 2 years, is difficult to find in orchards.

Mississippi. C. Lyle (June 25): On account of the severe drought throughout the northern and central parts of Mississippi this month, red spider injury has been severe. The southern part of the State, with more rainfall, has apparently suffered less.

Utah. G. F. Knowlton (June 6): Red spiders are damaging raspberries, strawberries, and dewberries at Pleasant Grove and Linden.



## CEREAL AND FORAGE - CROP INSECTS

### WHEAT

#### HESSIAN FLY (Phytophaga destructor Say)

New York. N. Y. State Coll. Agr. News Letter (June 15): Hessian fly has done considerable damage to the wheat in some sections of Genesee County. Three fields that have been observed are infested practically 100 percent.

Ohio. T. H. Parks (June 25): The wheat-insect survey has started in the southern and central counties, where six counties have been visited. The average percentage of stems infested in four southwestern counties is 20.5 percent and for the two central counties is 12.4 percent. No lodging of straws has occurred and practically no commercial damage.

Indiana. C. M. Packard (June 16): Severe spring infestation and injury to many wheat fields seen in Posey and Gibson Counties. Much broken-over straw. Fly now mostly in flaxseed stage.

Iowa. C. J. Drake (June 24): Very light infestations throughout southern Iowa but no commercial damage.

Missouri. L. Haseman (June 24): Owing to the unusual weather, the spring brood did comparatively little damage in the State, and many farmers have harvested fair yields in fields that looked like a complete loss last fall. The spring brood has been about as abundant in the northern third of the State as in the southern two-thirds, where it was so threatening last fall. There is sufficient fly in wheat stubble over most of the State to seriously threaten early seeded wheat this fall. Fortunately, parasitization of flaxseeds in some areas is quite high.

#### WHEAT STEM MAGGOT (Meromyza americana Fitch)

Iowa. H. E. Jaques (June 22): The wheat stem maggot is to be found in many rye and wheat fields.

Kansas. H. R. Bryson (June 23): Wheat stem maggot is more abundant than usual this year.

#### A BILLBUG (Calendra sp.)

~~Kansas~~ Kansas. H. R. Bryson (June 26): The wheat billbug caused a considerable amount of wheat to go down in some fields west of McPherson. This is of considerable interest because the insect is also found in some of the adjoining grasses, especially Agropyron smithii.

### CORN

#### CHINCH BUG (Blissus leucopterus Say)

Virginia. H. W. Walker (June 24): Chinch bugs were reported by the county

arent as seriously injuring corn in Northampton County.

North Carolina. C. H. Brannon (June 27): Infestation of chinch bugs is generally heavy over the eastern and Piedmont sections of the State, for the first time in over a decade.

Ohio. T. H. Parks (June 11): Very few chinch bugs are present in the wheat fields and we anticipate no damage to corn. Young bugs hatched on June 11.

Indiana. D. W. La Hue (June 18): A survey of Tippecanoe County shows chinch bugs scarce in most wheat fields. Old bugs are disappearing. All stages of first brood, from eggs to fourth-instar nymphs, are now present.

Illinois. W. P. Flint (June 22): The weather during June has been almost ideal for chinch bug development. There will be no general outbreak in the State, but many scattered infestations occur throughout the central and, particularly, the west- and southwest-central parts of Illinois. Fields that were even lightly infested early in the season are producing many more bugs than in an average year.

Wisconsin. E. L. Chambers (June 24): As indicated by the survey made late last fall, there will apparently be little damage this summer, although the dry season is very favorable for chinch bugs. Limited serious outbreaks have been observed near Plum City, in Pierce County.

Iowa. C. J. Drake (June 24): Chinch bug damage is beginning to show up in about 10 southern counties. In most cases the bugs will not leave the small-grain fields until after the grain is cut. The infestation is very spotted, but a light population may be found in many southern and southeastern counties.

Missouri. L. Haseman (June 24): From central Missouri south the annual migration of chinch bugs from small grain to corn is now pretty well over, but in the northern counties migration is still in full swing. The heavy movement of bugs during the month has been particularly noticeable from Kansas City south to Joplin and in a northeasterly direction across to St. Louis and Hannibal, with some heavy epidemics in north-central Missouri. On some farms the bugs have been fully as abundant as in 1934, but heavy infestations have been more scattering.

Nebraska. M. H. Swenk (June 20): Chinch bugs appeared in injurious numbers in the small-grain fields of Richardson County in extreme southeastern Nebraska early in June, and 2,000 gallons of creosote were used in three townships in that county between June 4 and June 18. No serious infestations have been reported outside of Richardson County.

Kansas. H. R. Bryson (June 23): The chinch bug infestation in the vicinity of Manhattan is much lighter than it has been since 1934. In southeastern Kansas the bugs did considerable injury to the small grain on



the uplands earlier in the season. Enough bugs are present to warrant the construction of barriers.

Arkansas. D. Isely (June 24): Scattered local outbreaks of chinch bugs have been reported from the northern part of the State.

Oklahoma. F. A. Fenton (June 23): Chinch bugs have appeared in several of the counties in the State and are now migrating from small grains to corn. Although not widespread, the infestation is more serious than it has been since 1934.

C. F. Stiles (June 20): There is a section consisting of about five counties in east-central Oklahoma that is very heavily infested. Rainfall there has been only about half the normal amount. Large populations have been built up and the bugs are moving from small-grain to row crops. About a half carload of oil, that we have had in reserve, is being used to construct barriers; however, this will only partly meet the demand.

#### HAIRY CHINCH BUG (Blissus hirtus Montd.)

Massachusetts. E. P. Felt (June 24): The hairy chinch bug was recorded as occurring in large numbers in a lawn at Lenox.

#### STALK BORER (Papaipema nebris nitela Guen.)

Indiana. J. J. Davis (June 22): The stalk borer was reported to be attacking corn at La Fayette and tomato at La Porte on June 16. In both places the borers were quite small, i.e., not over  $\frac{1}{2}$  inch long.

Minnesota. A. G. Ruggles (June 20): The stalk borer is moderately abundant in Minnesota.

Iowa. H. E. Jaques (June 22): The common stalk borer seems to be more than usually abundant throughout the State.

Missouri. L. Haseman (June 24): During the month we have had numerous complaints of stalk borers from almost every section of the State. At this time they are about half grown.

Nebraska. M. H. Swenk (June 17): A Thurston County correspondent reported the common stalk borer working on tomato stems.

Kansas. H. R. Bryson (June 11): The common stalk borer is reported injuring tomatoes at Brookville and White City, corn at Leavenworth and Clyde, and potatoes at Mulberry.

#### CORN EAR WORM (Heliothis obsoleta Fab.)

New Jersey. T. J. Headlee (June 24): Small numbers of larvae are now present in the field in the southern counties of the State. The infestations are



not so severe as at this time last year. Observations were made in several sweet-corn fields in Monmouth and Middlesex Counties on June 22, but no larvae were seen.

Alabama. J. M. Robinson (June 24): Corn ear worms are abundant in corn and are also attacking tomatoes in central and southern Alabama.

Mississippi. C. Lyle (June 25): Nearly all Plant Board inspectors have reported considerable damage to tomatoes.

Kansas. H. R. Bryson (June 23): Corn ear worm is causing considerable injury to the curl of field corn and the young ears of early sweet corn.

California. A. E. Michelbacher (June 20): Eggs were found in central California about June 1 on tomato plants. Eggs can now be found in most tomato fields and in places a careful examination will reveal a few small larvae. An examination of the tomato fields about Visalia showed that the amount of fruit infested ranged from less than 1 to 7 percent. On June 4 near Brentwood one corn field was examined and about 10 percent of the ears were found to be infested. In other fields in the same area not more than 1 percent of the ears were infested. Some of the larvae were nearly mature.

#### WEBWORMS (Crambus sp.)

Indiana. J. J. Davis (June 22): Webworms were reported to be damaging corn the first half of June in several localities in the northwestern quarter of the State.

Missouri. L. Haseman (June 24): Sod webworms were very troublesome last month, but they apparently ran their cycle by the early part of June.

#### SUGARCANE BEETLE (Euetheola rugiceps Lec.)

North Carolina. C. H. Brannon (June 25): The rough-headed corn stalk beetle is damaging corn over a wide area in the State.

Tennessee. G. M. Bentley (June 20): Specimens of the rough-headed cornstalk beetle were sent in from many parts of the State together with specimens of injured corn plants. In some years this insect proves to be a very serious pest, and reports received indicate that the injury this year will be serious.

Kentucky. W. A. Price (June 25): Rough-headed cornstalk beetles ruined a 10-acre field of corn at Mayfield.

Alabama. J. M. Robinson (June 24): At Malone the rough-headed cornstalk borer is seriously attacking several acres of corn. This insect is also active in Cullman County, particularly at Hanceville.

Mississippi. C. Lyle (June 25): The rough-headed cornstalk beetle has caused unusually heavy damage this spring in the northern half of Mississippi.

SOUTHERN CORN LEAF BEETLE (Myochrous denticollis Say)

Nebraska. M. H. Swenk (May 26): Specimens of the southern corn leaf beetle were sent in on May 26 from Washington County, where they were reported to be doing considerable damage to young corn plants just coming through the ground. This is the first record for Nebraska of this pest's damaging corn.

IMBRICATED SNOUT BEETLE (Epicaerus imbricatus Say)

Wisconsin. C. L. Fluke (June 20): Found large numbers of imbricated snout beetles injuring corn at Monroe on May 23.

FIELD CRICKET (Gryllus assimilis Fab.)

South Dakota. H. C. Severin (June 21): The black field cricket has done considerable damage to germinating corn in central and western South Dakota. Replanting of some entire fields was necessary.

SORGHUM

A FALSE WIREWORM (Eleodes sp.)

Oklahoma. C. F. Stiles (June 22): I find that one of the false wireworms has been doing enormous damage to the rowed sorghums in Beaver County. It seems that the adults at this time are causing most of the damage.

ALFALFA

ALFALFA WEEVIL

(Hypera postica Gyll.)

Nebraska. M. H. Swenk (June 18): Specimens collected in western Nebraska have been identified by A. G. Boving and L. L. Buchanan.

Idaho. R. W. Haegeler (June 15): The alfalfa weevil is present in southwestern Idaho. Damage to first crop is moderate and scattered. The parasite Bathyplectes curculionis Thos. is very abundant. At Parma on June 11, just before cutting of the first crop, 100 sweeps of a 12-inch net yielded 297 weevil larvae and 521 adults of the parasite.

F. H. Shirek (June 1): Alfalfa weevil is more abundant in the Parma district than in any previous season since 1930. No severe injury appears to have been caused to the first cutting of alfalfa.

Utah. C. J. Sorenson (June 10): Some damage apparent by alfalfa weevil, which is moderately abundant in Millard County.

California. A. E. Michelbacher (June 20): The larval population of the alfalfa weevil has slightly increased during the month. In several fields as many as 200 can be collected to 100 sweeps of an insect net. The increase is probably due to the fact that some of the early brood have matured. Parasitization by Bathyplectes is falling off rather rapidly. The decrease is most marked in the San Joaquin Valley.



## FRUIT INSECTS

### ROSE LEAF BEETLE (Nodonota puncticollis Say)

New York. N. Y. State Coll. Agr. News Letter (June): Rose leaf beetles are damaging fruit in the Hudson River Valley.

Maryland and Virginia. W. H. White (June 3): During the latter part of May and the early part of June many reports have been received regarding the abundance of the rose leaf beetle to rose, peonies, azalea, raspberry, and strawberry in parts of Maryland and Virginia adjacent to the District of Columbia.

West Virginia. L. M. Peairs (June 18): This chrysomelid has done a lot of damage to apples and other fruits. We have it from the Eastern Panhandle where it is generally distributed, and from as far west as Lewis County. (Det. by H. S. Barber as Nodonota, probably puncticollis.)

#### A CHRYSOMELID (Gastroidea aenea Melsh.)

Virginia. W. J. Schoene (June 25): This leaf beetle was very abundant during the last week of May and the first week of June. It ate holes in the sides of many apples and was very abundant in roses and other flowers. It has accounted for about as much injury to fruit as the worst of our early season pests.

### FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Georgia. T. L. Bissell (June 25): Borers have done very little injury to pecan trees at Milner and Macon the past year, in comparison to injury in the same orchards in previous years.

Missouri. L. Haseman (June 24): The adult was on wing throughout June but no activity of the larvae has been noted on trees visited by the beetle.

Nebraska. M. H. Swenk (May-June): Reports of injury to fruit and shade trees were received during the last 2 weeks of May, and the first 2 weeks of June from Douglas, Washington, Dodge, Seward, Buffalo, and Hayes Counties.

### A FLOWER THRIPS (Frankliniella occidentalis Perg.)

California. S. Lockwood (June 12): The blossom thrips has been responsible for considerable scarring to stone fruit in Contra Costa, Solano, Placer, and Tulare Counties.

### PLANT BUGS (Lygus spp.)

Michigan. R. Hutson (June 25): The tarnished plant bug (L. pratensis L.) has been reported as very abundant on peaches from Albion, Howell, Grand Rapids, Fennville, Sodus, and Hartford.

Connecticut. P. Garman (June 19): L. caryae Knight and other species are present in some orchards but not so abundant as they were last year.



APPLE

CODLING MOTH (Carpocapsa pomonella L.)

- New York. D. W. Hamilton (June 22): At Poughkeepsie peak moth captures in light and bait traps occurred on the nights of June 1 and 2. Since then activity seems to have gradually tapered off. First-brood larvae began entering the fruit on June 6. Peak entrances occurred from June 10 to 14. At present the infestation appears to be about normal. Low temperatures and rains have prevented extensive adult activity on many nights.
- New Jersey. T. J. Headlee (June 24): Emergence this year began 10 days earlier than last year. The prospects now are for a full second brood and a partial third in southern New Jersey.
- Delaware. L. A. Stearns (June 23): First-brood injury at this date is lighter than at any time since 1929. First-hatched larvae are already mature.
- Pennsylvania. H. E. Hodgkiss (June 23): First-brood larvae were first seen going into apples in Cumberland and Franklin Counties on June 18 and 19. The entries had been made since June 11.
- Maryland. E. N. Cory (June 25): Emergence in Washington County was considerably delayed on account of cool weather.
- Ohio. T. H. Parks (June): Moths have been caught in the bait pans at Columbus almost daily from May 16 to June 21. Heaviest flight occurred between May 30 and June 5. First entrances were noticed on June 9, the same date on which entrances were noticed in Ottawa County.
- Indiana. J. J. Davis (June 22): Codling moth is noticeably increasing in the southern half of the State. Unfavorable conditions during the season of 1955 and the past two winters reduced the insect to almost negligible numbers. However, conditions for the first 1936 brood have been favorable and the population has built up to threatening numbers. For record we are summarizing life-history records, those at Bicknell, Elberfeld, and Vincennes, by L. F. Steiner, and those at Orleans by G. E. Marshall. First pupae were found at Elberfeld on April 10; at Bicknell on April 13. First moth at Elberfeld on April 30; in traps at Bicknell on May 4; at Orleans in out-of-door emergence cage on May 4, in packing shed on May 5, and in bait trap on May 7 (last year, first moth bait trap on May 8). First eggs laid in insectary at Vincennes, under normal out-of-door conditions on May 7, began hatching on May 14. At Orleans the first eggs hatched on May 21. First larval entries at Vincennes were observed on May 19. First larvae left apple to pupate at Orleans on June 8 and at Bicknell on June 10.
- L. F. Steiner (June 11): Practically no moth activity either at Vincennes or Bicknell for the past 10 days. Mature larvae began leaving apples at Bicknell on June 10. In most orchards where the codling moth

produced the least injury in many years last season it is now back to its normal abundance. The light-to-moderate crop at Elberfeld is nearly 40 percent damaged. (June 22): Damage by first-brood larvae is as severe at Vincennes as has been observed for several years, despite a subnormal carryover from 1935.

Illinois. W. P. Flint (June 22): In southern Illinois the codling moth has developed so rapidly that it is now nearly as abundant as it was in the spring of 1934, although the last-winter carry-over was the lowest in 6 years.

Kentucky. W. A. Price (June 25): In some orchards, particularly in the Henderson district, there is a heavy infestation. A normal carry-over with a reduced crop this year has resulted in a larger number of worms entering individual fruits. Some apples have as many as five worm entrances.

L. F. Steiner (June 11): Mature larvae began leaving apples at Henderson about June 2. Now they are leaving in large numbers. The injury is almost 40 percent, and in some orchards it appears even worse.

Michigan. R. Hutson (June 20): A full flight of moths occurred on June 5 at Hartford, Milburg, and Saint Joseph. (June 25): Larvae are fairly abundant and are from  $\frac{1}{4}$  to  $\frac{3}{8}$  inch long at Mason, Albion, Vandalia, and Buchanan.

Tennessee. G. M. Bentley (June 20): Where timely sprays have not been made, the codling moth is doing damage generally over the State, the injury being in small home orchards.

Georgia. C. H. Alden (June 22): At Cornelia first-brood moths have been emerging in large numbers, starting June 19.

Missouri. L. Haseman (June 24): Moths of the second brood began emerging in extreme southeastern Missouri on June 14 and 15, and in central and southwestern Missouri by June 19 and 20. In the northern part of the State they have been a few days later than in central Missouri.

H. Baker (June 24): First-brood damage was generally light at Saint Joseph, except in some poorly sprayed orchards. First-brood moths were taken in bait traps beginning June 18, or about a week earlier than expected.

Nebraska. M. H. Swenk (June): Larval mortality at Lincoln was about 91 percent last winter. Spring-brood moths began emerging about May 11 and first-brood eggs were being deposited by May 30. All first-brood larvae had pupated by June 13. The first complaint of damage was received from Buffalo County during the first week in June.

Kansas. H. R. Bryson (June 24): Second-brood adults are beginning to emerge. Population is building up from a low carry-over of last winter. A third



brood will be present this year, whereas only two broods were present last year.

Utah. C. J. Sorenson (June 19): The codling moth is very abundant in Cache and Utah Counties.

EASTERN TENT CATERPILLAR (Malacosoma americana Fab.)

Maine. H. B. Poirson (June): Throughout Maine the insect is much less abundant than in 1935.

Massachusetts. A. I. Bourne (June 25): Tent caterpillars began to hatch about the 9th or 10th of April and have been unusually abundant, fully as abundant as they were last year, particularly in the eastern part of the State.

Connecticut. W. E. Britton (June 22): The eastern tent caterpillar was just about as prevalent as last year in certain localities in southern Connecticut, but much less so in northern Connecticut. Many caterpillars died from "wilt" and many were parasitized.

New York. R. D. Glasgow (June 17): The eastern tent caterpillar, which has apparently reached its maximum abundance this year in many parts of eastern New York, has been reduced by a wilt disease in parts of Albany County and elsewhere.

R. E. Horsey (June): Eastern tent caterpillar was abundant in a territory extending to 10 miles south of Rochester on May 31.

Pennsylvania. R. M. Baker (June 9): First adults appeared in Clark's Valley on June 6. The infestation was spotted this year, indicating a decline in population in some sections of the State.

FRUIT TREE LEAF ROLLER (Cacoecia argyrespila Walk.)

Ohio. T. H. Parks (June): Apple leaf roller is more abundant than usual in all parts of Ohio. In some orchards it has disfigured a high percentage of the fruits.

LEAF CRUMPLER (Mineola indigenella Zell.)

Alabama. J. M. Robinson (June 2): The larva of the leaf crumpler was reported attacking apple trees at Uriah on May 9. Adults emerged on May 20. They were reported as being serious pests to apple in that area.

EYE-SPOTTED BUDMOTH (Spilonota ocellana Schiff.)

Massachusetts. A. I. Bourne (June 25): We found budmoth to be rather more abundant than usual on the fruit crops.

New York. N. Y. State Coll. Agr. News Letter (June): Quite an infestation of budmoth developed in a few localities in western New York.



## FRUIT APHIDS (Aphidae)

- Massachusetts. A. I. Bourne (June 25): We noted that apple aphids in orchards at Amherst were hatching as early as March 28, owing to warm weather.
- Connecticut. P. Garman (June 19): Rosy apple aphid (Anuraphis roseus Bak.) is very abundant in some orchards. The outbreak, however, is by no means general. A decided increase took place from June 1-15, but migration is now well under way.
- New York. N. Y. State College Agr. News Letter (June 29): The rosy aphid has built up to serious proportions in many orchards in Niagara County and is also causing concern to orchardists in Monroe and Wayne Counties.
- New Jersey. T. J. Headlee (June 24): Infestation of the green apple aphids (Aphis pomi DeG.) began showing up in some orchards by June 10. The infestation in some orchards, where growth of foliage was active, has reached a point where sprays are advisable.
- Pennsylvania. H. E. Hodgkiss (June 23): The rosy apple aphid has caused fruit injury in many orchards throughout the State, but no commercial damage has been done. The green apple aphid is reported to have started on water sprouts during the week of June 15.

## APPLE MAGGOT (Rhagoletis pomonella Walsh)

- New York. N. Y. State Coll. Agr. News Letter (June 22): Flies began emerging from trap areas in the vicinity of Poughkeepsie on June 17. The first emergence for the Hudson Valley is at least 4 days earlier this year than it was in 1935.

## APPLE CURCULIO (Tachypterellus quadrigibbus Say)

- Vermont. H. L. Bailey (June 18): Adults of apple curculio were found on apple at Montpelier on June 8.
- Ohio. T. H. Parks (June): Specimens of apple curculio with injured fruit were received from Hamilton County with the statement that the insect is injurious in several orchards.
- Indiana. J. J. Davis (June 22): Apple curculio has been noticeably more abundant throughout the State than for many years.
- Missouri. L. Haseman (June 24): During the first week in June a very severe epidemic of apple curculios showed up in northeastern Missouri, extending from Elsberry north through Clarksville and Louisiana to Hannibal. Less noticeable outbreaks were also observed at Macon and Chillicothe. There was practically no evidence of the insect at Columbia and in the other important orchard centers of the State. Near timber, fruits on many trees were damaged practically 100 percent, with from 1 to 100 punctures to the apple. The attack largely subsided by the 15th of the month.

A SCARABAEID (Pachystethus marginata Fab.)

North Carolina. C. H. Brannon (June 25): Seriously damaging apple leaves and fruit in an orchard in western North Carolina.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Massachusetts. A. I. Bourne (June 25): European red mite has been very abundant in many orchards and seems to be giving more trouble this year than usual.

Connecticut. P. Garman (June 19): European red mite is present in some locations and is abundant in a few orchards.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Vermont. H. L. Bailey (June 18): Adults of the plum curculio were found on apples at Montpelier on June 8.

Connecticut. P. Garman (June 19): Plum curculio is from moderately abundant to severe in some orchards in New Haven County.

Rhode Island. A. E. Stone (June 22): Plum curculio apparently more abundant than during the past two seasons.

New York. N. Y. State Coll. Agr. News Letter (June): The plum curculio is causing more damage than usual in some orchards in western New York.

Georgia. O. I. Snapp (May 28): The first new beetles of the season emerged today from soil in the laboratory at Fort Valley. May 28 was also the emergence date of the first new beetle in the laboratory last year. (June 12): New beetles are now emerging in numbers from the soil in commercial peach orchards at Fort Valley. Recent thundershowers have facilitated their escape from the soil after a long drought. We took 96 new beetles from 24 trees in a commercial orchard today where there were practically no beetles last week. (June 18): The first eggs of the second generation were recorded yesterday. Eggs were obtained from 2 of 156 individual pairs examined. These pairs emerged on June 2 in the laboratory, somewhat earlier than in the field. (June 19): The infestation at Fort Valley continues to be less than that of an average year. No trouble from a second brood is anticipated in varieties ripening before the Elberta.

C. H. Alden (June 22): The peak of first-brood emergence occurred in the Thomaston section on June 9. The first curculio was caught on June 16 at Cornelia; peak emergence has not occurred there yet.

Tennessee. G. M. Bentley (June 20): The two-month drought and the plum curculio attack on unsprayed orchards have caused a heavy drop of plums and peaches. This, however, is true only of the uncared-for trees.



Indiana. J. J. Davis (June 22): Plum curculio is more abundant than usual throughout the State. Injury was observed only a few days after petal fall in southern Indiana, during the week of May 3.

Minnesota. A. G. Ruggles (June 20): Plum curculio has been moderately abundant.

WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

California. H. C. Donohoe (June 1): A grower in the vicinity of Fresno reports that the western twelve-spotted cucumber beetle is seriously damaging ripe early peaches. It attacked home vegetables and ornamental garden plants more severely than in a normal year.

SHOT-HOLE BORER (Scolytus rugulosus Ratz.)

Georgia. T. L. Bissell (June 9): Infestation of peach trees by bark beetles at Griffin is very noticeable in some orchards. The beetles bore into the base of leaf clusters and of fruit pedicels, killing the leaves. Injury is traceable to the improper disposal of peach prunings. A report of plum, similarly infested comes from Columbus.

Alabama. J. M. Robinson (June 2): In Double Springs peach trees were dying from winter injury and shot-hole borers were attacking the dying trees.

A CURCULIONID (Sitona prominens Csy.)

Georgia. O. I. Snapp (June 19): These beetles are more abundant at Fort Valley than usual. They have the habit of congregating on peaches in the depression around the stem.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (June 19): The first generation of the oriental fruit moth is extremely scarce.

New York. N. Y. State Coll. Agr. News Letter (June): Twig injury has been observed in orchards in Monroe and Orleans Counties.

Delaware. L. A. Stearns (June 23): Parasitization of first-brood larvae is below normal. The first second-brood eggs were deposited on June 17, and the first second-brood larvae hatched on June 21.

New Jersey. G. J. Haussler (May 18): First-brood larvae began entering peach twigs in the vicinity of Moorestown about May 14, approximately 2 weeks earlier than last season. In several orchards in Burlington County infested twigs are already fairly abundant and the first-brood infestation is considerably more severe than that of 1935. (May 26): The first-brood infestation is very light at Glassboro and Richwood, in Gloucester County, and at Lawrenceville and Glenmore, in Mercer County.



- Maryland. H. W. Allen (May 16): Infestation of peach twigs by first-brood larvae was observed to be from light to moderate in the vicinity of Salisbury.
- Virginia. H. W. Allen (May 12-14): Infestation of peach twigs by first-brood larvae was observed to be heavy in the vicinity of Lovington; moderate at Bonsac, Cloverdale, Winchester, and Washington; and light at Crozet, Waynesboro, Staunton, and Timberville.
- Georgia. O. I. Snapp (June 19): The infestation is lighter than usual. It is confined to home orchards in and near Fort Valley.
- T. L. Bissell (June 24): A small number of peach shoots were found infested with larvae today at Rover, in Spalding County.
- Ohio. T. H. Parks (June): Peach trees were very slow to recover from the severe winter injury and have shown more than the usual degree of infestation. There are no peaches, except a light crop in the lake-shore counties.
- Indiana. J. J. Davis (June 22): Injury is rather conspicuous throughout the State.
- Illinois. W. P. Flint (June 22): Large numbers of second-brood moths emerged in the southern part of the State. The hot weather hardened the twigs of the peach earlier than usual and many of the young larvae are dying in attempting to enter.
- Kentucky. W. A. Price (June 25): The oriental fruit moth is now very abundant in peach twigs.
- Tennessee. G. M. Bentley (June 20): A general infestation is noticeable. The second brood is just beginning to appear.
- Missouri. L. Haseman (June): Second-brood worms in some orchards have appeared in unusual numbers during the month, destroying the tips of most of the young succulent growth.
- Mississippi. C. Lyle (June 25): More injury has been observed during June than in May; however, the damage this season is much less than last year.

PEACH BORER (Aegeria exitiosa Say)

- Delaware. L. A. Stearns (June 17): Peach tree borer infestation is rather scarce throughout Hale blocks but adjoining blocks of Elberta and Golden Jubilee peaches are lightly infested.
- Georgia. O. I. Snapp (June 19): Pupation, which started at Fort Valley unusually early this year, has been retarded by the drought.

A MIRID (Lopidea robiniae Uhler)

Mississippi. C. Lyle (June 25): Bugs were causing serious injury to peaches at Pickens on June 17. They were spreading from black locust trees to the peaches.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

Connecticut. P. Garman (June 19): Pear psylla is present generally but so far not abundant, except in an occasional orchard.

New York. N. Y. State Coll. Agr. News Letter (June): The pearpsylla is very abundant in the Hudson River Valley, where much damage is anticipated. The insect is less abundant in western New York.

CHERRY

CHERRY FRUIT FLIES (Rhagoletis spp.)

New York. N. Y. State Coll. Agr. News Letter (June): Cherry fruit fly emergence has run as follows in a cage operated jointly by Columbia and Dutchess Counties: R. fausta O.S. was found in an orchard on May 26 and another individual was not found until June 2. No more fruit flies emerged in the cage until June 4, when 2 R. cingulata Loew emerged. On June 5, 2 flies emerged; on June 6, 2; on June 8, 10; on June 10, 8; on June 11, 10; and on June 12, 47. All R. cingulata. The heavy emergence on June 12 was preceded by showers on the evening of the 11th and in the early morning of the 12th. Emergence did not begin in the cage until the day after showers, which occurred on June 3.

Michigan. R. Hutson (June 20): The dark-bodied cherry fruit fly (R. fausta) appeared at Gobles on June 3; at Niles on June 14; at Grand Rapids on June 6; at Hart on June 12; at Beulah and Benzonia on June 16; and at Traverse City on June 17. The white-banded cherry fruit fly (R. cingulata) appeared at Niles on June 4; at Coloma, Fennville, and Grand Rapids on June 6; and at Traverse City on June 17.

BLACK CHERRY APHID (Myzus cerasi Fab.)

New York. N. Y. State Coll. Agr. News Letter (June 8): Black aphids are very abundant in Ulster County on sweet cherries where no spray was applied, and also abundant on sour cherries, especially Early Richmond, in some plantings.

Indiana. J. J. Davis (June 22): M. cerasi was very abundant in sweet cherry orchards at Bristol visited on June 19.

UGLY-NEST CATERPILLAR (Cacoecia cerasivorana Fitch)

Massachusetts. A. I. Bourne (June 25): The ugly-nest cherry worm was very

abundant throughout the eastern part of the State. Its work was very conspicuous as far west as central Worcester County.

CHERRY LEAF BEETLE (Galerucella cavicollis Lec.)

Michigan. R. Hutson (June 20): The cherry leaf beetle has been reported from Onaway, Bellaire, Boyne City, Iron Mountain, Cheboygan, Petoskey, Cadillac, and Traverse City.

PLUM

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Oklahoma. C. F. Stiles (June 20): The cottony-cushion scale has been reported on plum trees from Washita County. The infestation is quite heavy in some places.

RASPBERRY

RASPBERRY SAWFLY (Monophadnoides rubi Harr.)

Michigan. R. Hutson (June 20): The raspberry sawfly is exceedingly abundant in the vicinities of Monroe, Adrian, and Ann Arbor.

GRAPE

GRAPE ROOT WORM (Fidia viticida Walsh)

Delaware. L. A. Stearns (June 17): Adults of the grape root worm are abundant in several vineyards at Camden. The 10-day spray is being applied.

GRAPE PLUME MOTH (Oxyptilus periscelidactylus Fitch)

Massachusetts. A. I. Bourne (June 25): The grape plume moth was the cause of more complaints from all sections of the State during the latter part of May than we usually receive.

New York. N. Y. State Coll. Agr. News Letter (June 1): Grape plume moth was abundant on Ulster County grapes that had been neglected.

Ohio. E. W. Mendenhall (May 30): The grape plume moth is found in and about Columbus.

DATES

NAVEL ORANGE WORM (Myelois venipars Dyar)

Arizona. D. F. Barnes (May 5): Larvae in dates collected near Tempe in November 1935 by K. B. McKinney, D. F. Barnes, and Perez Simmons produced adults which have been identified by C. Heinrich. Larvae were found in dates on the palms but were much more abundant in fallen dates.



## TRUCK - CROP INSECTS

### FALSE CHINCH BUG (Nysius ericae Schill.)

- Michigan. R. Hutson (June 25): The false chinch bug has been causing some damage on strawberries in the vicinity of Fennville and South Haven.
- Wisconsin. E. L. Chambers (June 24): Nursery inspectors report the false chinch bug very abundant in central Wisconsin strawberry patches.
- Minnesota. A. A. Granovsky (June 22): False chinch bug infesting cornfields in Wadena County.
- North Dakota. J. A. Munro (June): Field-crop injury is subsiding.
- South Dakota. H. C. Severin (June): A terrific outbreak of false chinch bug has occurred in South Dakota. Crops attacked are garden crops, small grains, flax, alfalfa, sweetclover, fruit trees, and berries. Bugs are attracted in immense numbers to electric lights. In front of store windows they could be scooped up by handfuls.
- Nebraska. M. H. Swenk (June 20): The common false chinch bug was reported as attacking corn in Fillmore County on June 16.
- California. S. Lockwood (June 12): Sporadic but localized outbreaks of the false chinch bug have occurred on grapes in Napa, Sacramento, and Merced Counties and have caused small loss to young tomato plants in Sacramento County.
- C. K. Fisher and D. F. Barnes (June 11): False chinch bugs were doing some damage on May 13--enough to necessitate treatment in spots in a young vineyard 10 miles southeast of Fresno. Some leaves were entirely killed by bugs.

### FLEA BEETLES (Malticinae)

- New York. N. Y. Coll. Agr. News Letter (June 15): Flea beetles are becoming serious in the western part of the State.
- Michigan. R. Hutson (June 20): The triangle flea beetle (Disonycha triangularis Say) has been exceedingly abundant on spinach and other garden crops at East Lansing, Lake Odessa, Fremont, Clarksville, Grand Rapids, and Charlotte.
- Ohio. T. H. Parks (June): The pale-striped flea beetle (Systema taeniata blanda Melsh.) is quite injurious in several northwestern Ohio counties and is reported feeding upon young corn, tomatoes, and sugar beets.
- Indiana. J. J. Davis (June 22): The pale-striped flea beetle has been very abundant and destructive to tomato plantings throughout the northern half of the State, reports being received on June 8 and every day since that date. Several reports of injury to field and sweet corn have also been

received. While most reports are from the northern half of the State, one report from North Vernon reports damage to corn. The sinuate flea beetle (Phyllotreta vittata Fab.) was abundant in alfalfa at Winamac about June 10.

Illinois. W. P. Flint (June 22): Pale-striped flea beetles have been abundant throughout the northern two-thirds of the State. It has been attacking corn, soybeans, garden beans, and some other crops.

Missouri. L. Haseman (June 24): Recently one of the common black flea beetles usually found feeding on bullnetties has been attacking potatoes very heavily and doing much damage to the foliage.

Nebraska. M. H. Swenk (June 19): A complaint was received on June 19 from Franklin County, stating that the western cabbage flea beetle (P. pusilla Horn) was damaging the leaves of radishes and kohlrabi.

Utah. G. F. Knowlton (June 18): Flea beetles are seriously damaging young tomato plants at Logan. Only moderate damage to sugar beets in fields examined this spring.

#### BLISTER BEETLES (Meloidae)

North Carolina. C. H. Brannon (June 15): Blister beetles are unusually abundant on potatoes this year.

South Dakota. H. C. Severin (June): Garden crops, leaves of trees and bushes, alfalfa, sweetclover, and potatoes are the main crops being attacked over much of the State. Damage is severe.

Kansas. H. R. Bryson (June 22): Blister beetles, Epicauta sp., apparently are quite numerous this year and are causing considerable injury to garden crops. Reports of injury to potatoes have been received from Fredonia, Clay Center, and Wanego. Garden crops in general were reported injured at Onaga, Hazelton, Manhattan, and Sedan.

#### YELLOW WOOLLY BEAR (Diacrisia virginica Fab.)

Nebraska. M. H. Swenk (June): Woolly bears were repeatedly reported eating the leaves of rhubarb, lettuce, beets, and other garden plants in Lancaster and Washington Counties during the third week in June.

#### SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

Wisconsin. E. L. Chambers (June 24): Seed corn maggots are unusually severe in many southern counties requiring replanting beans and corn in a great many places.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

- Indiana. J. J. Davis (May 28): Adults are damaging tomatoes at Frankfort.
- Minnesota. A. G. Ruggles and assistants (June): The Colorado potato beetle is from moderately to very abundant in the southern third of the State.
- Iowa. H. E. Jaques (June): Very abundant in places in the west-central part of the State.
- Missouri. L. Haseman (June 24): The Colorado potato beetle has been more abundant on many patches than for many years. On the other hand, they seem to be scattered, as other patches have scarcely been touched.
- Tennessee. G. M. Bentley (June 20): A small number found in commercial Irish potato-growing sections of the State.
- Idaho. R. W. Haegele (June 15): Numerous infestations are appearing again in Canyon County. There has been no injury since 1934.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

- Vermont. H. L. Bailey (June 18): Potato flea beetles generally abundant.
- Connecticut. N. Turner (June 24): Causing the usual amount of damage to potatoes.
- Indiana. J. J. Davis (June 22): The potato flea beetle was damaging potatoes at Linton early in the month.
- Minnesota. A. G. Ruggles (June 20): Potato flea beetle is from moderately to very abundant on potatoes and tomatoes.
- Nebraska. M. H. Swenk (June): The potato flea beetle was reported damaging tomato plants in Thurston County on June 1, attacking potato plants in Richardson County on June 10, and doing injury to bean and cucumber plants in Sheridan County on June 12.

WESTERN POTATO FLEA BEETLE (Epitrix subcrinita Lec.)

- Washington. R. S. Lehman (June): The western potato flea beetle is doing considerable damage to the seedlings and the young tomato plants set out in the field. Some of the growers have had their seedlings destroyed before they noticed that germination had taken place.

POTATO APHID (Illinoia solanifolii Ashm.)

- New Jersey. T. J. Headlee (June 24): There is a general infestation on tomatoes and potatoes throughout the State, but the number of aphids per plant is still small.



Virginia. H. G. Walker (June 24): The pink and green potato aphid has been very scarce in the Norfolk area this spring.

TOMATO PINWORM (*Gnorimoschema lycopersicella* Busck)

Virginia. H. G. Walker (June 24): The tomato pinworm had been rather abundant for the past 2 years in a local greenhouse that had been growing late fall and early spring crops of tomatoes. The late fall crop was omitted last year and there has been no evidence of pinworms in the spring crop this year.

Mississippi. C. Lyle and assistants (June 25): A complaint of the tomato pinworm in tomato was received from New Augusta, Perry County on June 10. Damage in the trucking sections of Copiah and Lincoln Counties is lighter than usual.

HORNWORMS (*Phloethontius* spp.)

New Jersey. T. J. Headlee (June 24): The first moths of *P. quinquemaculata* Haw. and *P. sexta* Johan. were observed on June 5 feeding on nectar-producing flowers. *P. sexta* was more abundant. Several tomato and pepper fields were examined during the week of June 15-20 and 75 percent of the plants in some fields in Cumberland, Atlantic, and Salem Counties contained one or more eggs.

California. A. E. Michelbacher (June 20): A few horn worms can be found in many tomato fields in central California. Many of these are reaching maturity.

BEANS

MEXICAN BEAN BEETLE (*Epilachna varivestis* Muls.)

Connecticut. N. Turner (June 24): Eggs were found as early as May 25 in southern Connecticut. Apparently not as abundant as in 1935.

New York. N. Y. State Coll. Agr. News Letter (June): The bean beetle was observed the first week in June on Long Island. By the last week of the month larvae were appearing in Suffolk County and adults were causing considerable injury in Chautauqua County.

New Jersey. T. J. Headlee (June 24): Injury does not seem to be as severe as it was this time last season. Very few growers have had to apply treatments.

M. Kisliuk (June 12): Mr. Kostal has noted that the Mexican bean beetle has been much less abundant on garden beans at Morganville, in Monmouth County, than at any time during the past five seasons.

Pennsylvania. C. D. Thomas (June 10): Bean beetles plentiful and very destructive on beans at Emerald.

Virginia. W. J. Schoene (June 25): The most unusual occurrence is the scarcity of the Mexican bean beetle in many sections of the State. At Blacksburg beans will mature with practically no injury. Apparently beetles are still emerging from hibernation.

North Carolina. C. H. Brannon (June 26): Serious damage is just beginning to appear generally over the State.

South Carolina. C. O. Bare (June 18): Five locations in plots totalling about one-third acre of beans at the Truck Experiment Station farm at Charleston were found to be infested with larvae and adults. About 2 weeks prior to this a dead beetle had been found among cabbage leaves. This is the first season that this insect has been found on the farm.

Georgia. C. H. Alden (June 15-22): Very abundant on unsprayed beans around Cornelia.

Tennessee. G. M. Bentley (June 20): The beetle is less noticeable this year in all parts of Tennessee than it has been for several years.

Mississippi. C. Lyle and assistants (June 25): The first noticeable damage at Aberdeen was found on May 23. A complaint was received from Hattiesburg on June 3. An infestation was found at Purvis, Lamar County, on June 19, this being a new county infested by spread from Hattiesburg. The beetles were quite abundant at Laurel, Jones County, on June 8, its first appearance in that town.

Ohio. E. W. Mendenhall (June 22): The Mexican bean beetle is causing much damage.

Indiana. J. J. Davis (June 22): Mexican bean beetle is beginning to show up in some localities, but is not as injurious as in 1935. First observed on beans at Lafayette on May 27.

#### PEAS

##### PEA APHID (Illinoia pisi Kalt.)

New York. N. Y. State Coll. Agr. Weekly News Letter (June 8): Hugh Glasgow reports that the pea aphid is developing rapidly in Ontario County, some fields being already heavily infested, and it looks very much as if we are going to have a repetition of the trouble we had last year. I have found fields where from 60 to 70 percent of the plants are infested, and infestations of from 20 to 40 percent are not uncommon. R. D. Morgan reports that in Genesee County it is not hard to find lice in the pea fields, although the infestation is not serious.

Michigan. R. Hutson (June 20): The pea aphid is numerous at Fremont, Owosso, Lake Odessa, Saginaw, and St. Johns.



- Wisconsin. E. L. Chambers (June 24): Extremely heavy losses from the pea aphid to canning peas of the early crop just being harvested are reported from all sections of the State.
- Missouri. L. Haseman (June 24): In spite of the recent drought and hot weather, quite a sprinkle of the common pea aphid has recently appeared on garden peas at Columbia. The ladybeetles, however, have been very active in keeping them under control.
- Kansas. H. R. Bryson (June 23): Reported causing injury to garden peas at Ozawakie.
- Mississippi. C. Lyle (June 25): Serious damage to English pease was reported from Beach on May 26.
- Utah. G. F. Knowlton (June 25): Pea aphids have seriously damaged one field of canning peas in North Logan, and damage to peas is rather general in northern Utah. Large numbers of aphids are dispersing from pea fields in the Weber County area to tomatoes and other crops. This condition is causing considerable local worry. (June 28): Injury to peas becomes more serious daily throughout northern Utah. Some commercial patches have been ruined. This is the most serious outbreak in more than 11 years.

#### ZEBRA CATERPILLAR (Mamestra picta Harr.)

- Indiana. J. J. Davis (June 22): Zebra caterpillar larvae about  $\frac{1}{4}$  inch long were abundant on garden peas at Fort Wayne on June 16 and were riddling foliage of gladiolus at Greenfield on June 15.

#### CABBAGE

##### CABBAGE INSECTS (Lepidoptera)

- Virginia. H. G. Walker (June 24): The cabbage looper (Autographa brassicae Riley) and the larvae of the diamond-backed moth (Plutella maculipennis Curt.) have been very scarce this spring around Norfolk.
- South Carolina. W. J. Reid and C. O. Bare (June 24): Although retarded to a considerable extent by adverse weather during the winter and early spring, the populations of the three more important species of green worms that attack cabbage in this locality--the diamond-back moth, the cabbage looper, and the imported cabbage worm (Ascia rapae L.)-- became so numerous during May and the early part of June as to cause severe damage to the late plantings of cabbage. In experimental plantings the yield of Grade 1 cabbage was reduced from approximately 50 to 90 percent. In relative abundance the species occurred in the order named, from most to least abundant. One hundred and six larvae of the diamond-back moth, 12 cabbage loopers, and 10 imported cabbage worms were known to have developed to the pupal stage on single plants (not the same plants).



Mississippi. C. Lyle (June 25): The cabbage looper was reported on May 30 at Morton, was fairly abundant at State College at the same time and is reported by Inspector L. J. Goodgame as giving considerable trouble to cabbage in northern Mississippi.

#### IMPORTED CABBAGE WORM (Ascia rapae L.)

Virginia. H. G. Walker (June 24): The imported cabbage worm has been more abundant around Norfolk and caused more damage during the past month than it has in the past 4 years.

Pennsylvania. H. E. Hodgkiss (June 23): The second-brood adults of the imported cabbage worm are very abundant.

Tennessee. G. M. Bentley (June 20): There is very heavy infestation of imported cabbage worm noticed generally over the State this year.

Missouri. L. Haseman (June 24): The imported cabbage worm seemingly got a late start this year, but during the latter half of June has been unusually abundant. We have had complaints from most sections of the State.

Nebraska. M. H. Swenk (May 29): Cabbage worms were found attacking cabbage in Seward County on May 29.

#### CABBAGE MAGGOT (Hylemyia brassicae Bouche)

Pennsylvania. H. E. Hodgkiss (June 23): Root maggot has been unusually serious in radish plantings.

Indiana. J. J. Davis (June 22): Cabbage maggot reported damaging cabbage at Indianapolis on June 2.

Wisconsin. E. L. Chambers (June 24): The cabbage maggot continues to be a major truck-crop pest in cabbage-growing areas in southeastern Wisconsin and small gardeners report it more abundant than usual.

#### CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Walker (June 24): The cabbage aphid has been rather abundant on cabbage and seed kale at Norfolk but the outbreak is beginning to die out.

Tennessee. G. M. Bentley (June 20): Cabbage aphid continues to be present on cabbage in large numbers throughout the State.

Missouri. L. Haseman (June 24): During the first 2 weeks in June many gardeners and farmers lost much of their early cabbage from plant lice. About the middle of the month, however, they began to clear up.

Nebraska. M. H. Swenk (June 8): On June 8 a Nance County correspondent reported the cabbage aphid working on his cabbage.

A WEEVIL (Ceutorhynchus assimilis Payk.)

Washington. J. Wilcox and W. W. Baker (May 27): C. assimilis is abundant on seed cabbage and other crucifer seed crops at Mt. Vernon, in Skagit County and also in the northwestern part of Snohomish County. The seed men and farmers are very much concerned and are seriously considering control.

Oregon. J. Wilcox and W. W. Baker (May 27): C. assimilis was taken at Orenco in Washington County this year.

MELONS

STRIPED CUCUMBER BEETLE (Diabrotica vittata Fab.)

New York. N. Y. State Coll. Agr. Weekly News Letter (June 22): Numerous and destructive in Niagara County.

Virginia. H. G. Walker (June 24): Striped cucumber beetles were moderately abundant and injuring cucurbits in the Northern Neck of Virginia on June 5; however, this insect has not been nearly so destructive as it was last year.

Alabama. J. M. Robinson (June 2): The larva of Diabrotica sp., probably vittata, was attacking watermelon plants at Tuscaloosa on May 7.

Wisconsin. E. L. Chambers (June 24): Reports that the cucumber beetle is unusually abundant and are coming in from all sections of the State.

Minnesota. A. G. Ruggles and assistants (June): The striped cucumber beetle is from moderately to very abundant in some places in southern Minnesota.

South Dakota. H. C. Severin (June 21): Striped cucumber beetle attacking cucumbers generally. Much more abundant than usual.

Missouri. L. Haseman (June 24): Small numbers of spotted and striped cucumber beetles suddenly appeared from June 20 to 25 at Columbia.

Nebraska. M. H. Swenk (June): The striped cucumber beetle was reported damaging cucurbits in Thurston, Lancaster, and Greeley Counties during the first 3 weeks of June.

CARROT BEETLE (Ligyrus gibbosus DeG.)

Delaware. L. A. Stearns (June 10 and 18): Serious damage to cantaloupes and sunflowers at Seaford on June 10 and to sunflowers and marigolds at Greenville on June 18. Specimens of adults collected at Seaford were heavily parasitized.

MELON WORM (Diaphania hyalinata L.)

Georgia. T. L. Bissell (June 22): The melon worm is seriously damaging squash at Experiment.

PICKLE WORM (Diaphania nitidalis Stoll)

Georgia. O. I. Snapp (June 26): Although cantaloupes will not start to ripen until next week, the pickle worm has appeared on green melons in a 3-acre patch at Powersville.

Mississippi. C. Lyle (June 25): Complaints of injury have been received from Yazoo City, Starkville, Pascagoula, and Jackson.

SQUASH

SQUASH BUG (Anasa tristis DeG.)

Georgia. T. L. Bissell (June 22): The squash bug is seriously damaging squash at Experiment.

Kansas. H. R. Bryson (June 23): Squash bugs quite abundant this year. Have been laying eggs for 2 weeks.

Mississippi. C. Lyle and assistants (June 25): The squash bug is rather abundant. It is reported from Hollandale, Washington County, and also from Harrison County. A heavy infestation was noted at Kiln, Hancock County, late in May.

Missouri. L. Haseman (June 24): Although we have received a few complaints from gardeners throughout the State, this pest has been unusually scarce this month.

SQUASH BORER (Melittia satyriniformis Hbn.)

Georgia. T. L. Bissell (June 22): The squash vine-borer is seriously damaging squash at Experiment.

Mississippi. H. Gladney (June 25): Some damage by the squash vine borer has been observed in Harrison County.

Louisiana. T. E. Snyder (June 3): Larvae collected on beans on a farm near Pollock have been identified by C. Heinrich as M. satyriniformis. He says: "Bean is an unusual food plant."

CELERY

CARROT WEEVIL (Listronotus latiusculus Boh.)

New Jersey. T. J. Headlee (June 24): The parsley stalk weevil has caused considerable damage to celery on the muck soils in Bergen County this spring. This is the first time this species has been recorded as injurious in New Jersey. The infestation is quite general in the Hackensack area. Injury occurs in fields where growth ranges from newly set plants to those ready to harvest. Infestation counts from several fields revealed that from 15 to 40 percent of the plants were injured. Young plants were killed outright, and older ones rendered unfit for market.



## ASPARAGUS

### A CUTWORM (Euxoa excellens Grote)

Washington. J. Wilcox and W. W. Baker (May): E. excellens is injuring asparagus at Sumner, in Pierce County. An examination of a small plot of the worst infested part of a planting of 18 acres showed that 100 percent of the stalks had been attacked on May 25. The planter said that he has had similar damage for many years but never as severe as this. Some hills have a dozen larvae.

### ASPARAGUS BEETLE (Crioceris asparagi L.)

Washington. C. W. Getzendaner (May 29): Adults, eggs, and larvae have been found at Sumner. Damage is already apparent and beetles were found on nearly every plant. They are much more numerous than last year when the beetle was first discovered in this locality.

### ASPARAGUS MINER (Agromyza simplex Loew)

Washington. J. Wilcox and W. W. Baker (May 28): Flies were observed on asparagus plants at Sumner, in Pierce County, but no damage was found. Flies were mating.

## ONIONS

### ONION THRIPS (Thrips tabaci Lind.)

Connecticut. N. Turner (June 24): Appeared early in June on onions, much earlier than usual.

New Jersey. T. J. Headlee (June 24): Onion thrips have caused very little damage to early onions in southern New Jersey. The early crops are now being harvested. Several complaints have come in of thrips on seed onions in the muck sections of northern New Jersey.

Michigan. R. Hutson (June 25): The onion thrips is beginning to appear in onion fields about Marshall.

### ONION MAGGOT (Hylemyia antiqua Meig.)

Pennsylvania. H. E. Hodgkiss (June 23): The onion maggot has caused much damage, especially in the western counties.

Michigan. R. Hutson (June 25): Onion maggot has been reported as abundant at East Lansing, Howell, and Marshall.

### A MIRID (Labopidea allii Knight)

Iowa. C. J. Drake (June 24): The onion mirid did considerable damage in small onion fields in southeastern Iowa. In Bloomfield some small patches of onions were almost destroyed.

## CARROT

### CARROT RUST FLY (Psila rosae Fab.)

New York. N. Y. State Coll. Agr. Weekly News Letter (June 22): Maggot injury has been found in several late celery plant beds in Wayne County. Injury is most severe on the beds planted on muck that grew celery last year.

Washington. A. J. Hanson (May 28): Carrot rust fly is very serious in the Puget Sound district and is spreading every year. This pest has made it difficult to produce carrots for market in this section. (Det. by C. T. Greene).

## STRAWBERRY

### STRAWBERRY LEAF ROLLER (Ancylis comptana Froel.)

Wisconsin. E. L. Chambers (June 24): The strawberry leaf roller has been favored by dry weather and has been a major strawberry pest. A recent tour of inspection revealed that it is more prevalent than usual. Many requests for control measures are likewise being received.

Tennessee. G. M. Bentley (June 4): The strawberry leaf roller is reported to be doing damage at Dayton.

Nebraska. M. H. Swenk (June): Reports of damage to strawberry plants by the strawberry leaf roller were received from Gage and Custer Counties on May 23 and June 4, respectively.

Kansas. H. R. Bryson (June 20): Very abundant in northeastern Kansas, in the vicinities of Troy and Wathena.

Utah. G. F. Knowlton (June 11): First generation becoming abundant at Providence; moths still moderately abundant. (June 20): Strawberry leaf rollers are damaging strawberry foliage in Cache Valley.

### STRAWBERRY CROWN BORER (Tyloclerna fragariae Riley)

Kentucky. W. A. Price (June 25): The strawberry crown borer is abundant in some patches in the Paducah area.

## SPINACH

### SPINACH LEAF MINER (Pegomya hyoscyani Panz)

Connecticut. N. Turner (June 24): Serious damage to seed beets at Mount Carmel in the southern part of the State.

Pennsylvania. H. E. Hodgkiss (June 23): Spinach leaf miner very abundant. In Fayette County it is especially abundant in the valleys but does not occur at higher elevations.

Michigan. R. Hutson (June 20): The beet leaf miner is very numerous on sugar beets at Holland and moderately abundant on spinach at Fremont and Lake Odessa.

New York. M. Kisliuk (June 12): Since May 15 a progressive increase in the population of the spinach leaf miner on Long Island and in other rural centers near New York City has been noted. At first the infestation was hardly noticed but by June 10 a number of carloads had been rejected and nearly 100 percent of the spinach tops were found to have numerous maggots.

New Jersey. M. Kisliuk (June 12): E. Kostal remarked that this leaf miner is exceptionally severe in garden spinach, Swiss chard, and beet tops at Morganville, Monmouth County.

#### GREEN PEACH APHID (Myzus persicae Sulz.)

Pennsylvania. H. E. Hodgkiss (June 23): The green peach aphid has caused serious damage on spinach in the Philadelphia area.

#### RHUBARB

##### RHUBARB CURCULIO (Lixus concavus Say)

Pennsylvania. H. E. Hodgkiss (June 23): Rhubarb curculio has been generally abundant throughout the State.

Indiana. J. J. Davis (June 22): The rhubarb curculio has been frequently reported as damaging rhubarb. Reports received from May 13, at frequent intervals, to June 18. All reports have come from the northern half of the State, except one from Bedford, Lawrence County.

#### MINT

##### MINT FLEA BEETLE (Longitarsus waterhousei Kutsch.)

Michigan. R. Hutson (June 20): The mint flea beetle is causing considerable damage in Berrien County.

#### BEETS

##### BEET WEBWORM (Loxostege sticticalis L.)

Utah. G. F. Knowlton (June 25): Large numbers of moths are coming to light traps at Logan, Tremonton, Hooper, Clinton, Syracuse, Pleasant Grove, and Spanish Fork.

Wyoming. M. Greenwald (June 22): Millers were very numerous at Powell up to June 15, after which date they dropped off gradually in numbers. Worms are now numerous enough in some sugar beet fields to warrant spraying.



BEAN APHID (Aphis runicis L.) :

California. S. Lockwood (June 12): The bean aphid is more prevalent than usual in the Sacramento River Delta. They were numerous enough to shorten the crop of horse beans, and they migrated into sugar beets after the horse beans became dry. It is doubtful whether 800 acres of sugar beets in this region will withstand the attack made by these aphids.

SWEETPOTATO

SWEETPOTATO SAWFLY (Sterictophora cellularis Say)

Delaware. P. L. Rice (June 18): Very abundant in small area near Laurel, in Sussex County.

TORTOISE BEETLES (Cassidinae)

Delaware. P. L. Rice (June 10-18): Metritona bivittata Say is present in varying abundance in most fields in the Laurel-Seaford section. Injury severe in a few fields.

Alabama. J. M. Robinson (June 2): Tortoise beetles, M. bicolor Fab., M. bivittata, and Chirida guttata Oliv., were reported as attacking sweet-potato vines at Fairhope on May 6.

Mississippi. C. Lyle (June 25): The tortoise beetle (Chirida guttata) was attacking sweetpotatoes at New Albany on June 13.

C O T T O N   I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

Mississippi. C. Lyle (June 20): Infestation is very light throughout the northern and central parts of the State.

Oklahoma. C. F. Stiles (June 20): So far no weevils have emerged from the hibernation cages at Eufaula, where we have 25,500 in hibernation. This is the first year in the past 4 that weevils have not overwintered.

F. A. Fenton (June 23): The boll weevil has appeared in fields in the southeastern part of the State, being observed in McCurtain and Choctaw Counties. The infestation is spotted and light and no damage is being done.

Texas. F. L. Thomas (June 12): First-generation weevils now may be found in southern and central Texas and are already causing considerable injury. In one field of Victoria County, 75 percent of the squares were punctured, and in Matagorda County, 20 percent. Although little cotton is grown in the vicinity of Dimmit County, in one field examined 81 percent of the squares were found to be infested. (June 19): Boll weevils have been

found in Kaufman and Smith Counties in northern and northeastern Texas. They occurred at the rate of 50 per acre in Kaufman County. In 5 counties of southeastern Texas the infestation was 16 percent, with a maximum of 38 percent in Matagorda County. In 8 counties of southern Texas the average infestation on 11 farms was 15 percent, with a maximum of 40 percent in Jackson County. (June 26): The average infestation was 24 percent on 10 farms in the southern part and 27 percent on 7 farms in southeastern part of the State. This is an increase of 9 and 11 percent, respectively, over the infestation reported the previous week.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Texas. F. L. Thomas (June 12): Full-grown cotton leaf worms were found last week in Nueces County and half-grown specimens in San Patricio County. (June 19): The second-generation moths are now flying. The worms have been reported from Jim Wells County and as far up the coast as Matagorda County. (June 26): The first leaf worms to be reported in central Texas were found in the Brazos Bottoms of Burleson County on June 17.

APHIDS (Aphidae)

North Carolina. C. H. Brannon (June 26): Cotton is heavily infested with aphids over a wide area of the State.

Mississippi. C. Lyle (June 25): During the latter part of May and the early weeks of June, many fields of cotton in the southern part of the State were rather heavily infested with the cotton aphid (Aphis gossypii Glov.). With warm weather and an abundance of predators, the aphids have practically disappeared.

F. A. Fenton (June 23): Unusually prevalent on cotton at chopping time throughout most of the State and in some cases killed the plants, necessitating replanting. Most of the plants, however, had fully recovered by the end of the month.

COTTON FLEA HOPPER (Psallus seriatus Reut.)

Mississippi. C. Lyle (June 25): Infestation in the vicinity of State College is very light. The insect is present on several farms in the Delta and central part of the State.

Oklahoma. F. A. Fenton (June 23): Reports have been received of the presence of the cotton flea hopper. Injury at present seems to be centered in the southeastern part of the State in the counties along the Red River, especially in Bryan County.

Texas. F. L. Thomas (June 5): The average number of flea hoppers hatching from 100 cotton weeds in May was more than double the number hatching during any previous May for the past 10 years. (June 12): Flea

hoppers are increasing in southern and east-central Texas, but have not been found on cotton in northern Texas. (June 19): Reports have been received from 69 farms in 25 counties where control demonstrations are being conducted. These counties extend from Jim Wells, in the south, to Grayson, in northern Texas. Flea hoppers are present on 51 of the farms and are causing injury on 33. (June 26): Fleahoppers are more widely distributed than during last week, but are in smaller numbers on cotton in the State as a whole. However, their numbers increased and more than doubled on the farms examined in Ellis, Grayson, and Kaufman Counties, in northern Texas, but only in Grayson and Kaufman were they sufficiently numerous to be injurious. Increased numbers were also found on farms in Brazoria, DeWitt, Matagorda, Refugio, and Victoria Counties, but in 8 other counties along the coast and in 3 counties examined in central Texas there was a reduction in the number of flea hoppers.

A TENEBRIONID (Blapstinus sonora Csy.)

Arizona. T. P. Cassidy (May): This beetle caused considerable damage to cotton in parts of the Salt River Valley of Arizona in May by cutting off the seedlings near the surface of the ground. (Det. by E. A. Chapin.)

THRIPS (Thysanoptera)

Alabama. H. C. Young and T. Thompson (June): A severe outbreak of thrips (species not determined) is occurring on cotton at Cullman. The damage varies, but all fields show injury and in some from 50 to 75 percent of the terminal buds have been killed.

Mississippi. E. W. Dunnam and J. C. Clark (June 6): Thrips are causing some ragging in almost all fields. They are numerous in our experimental plats, blasting the buds in 10 percent of the plants after thinning. (June 20): Thrips are very plentiful in the cotton fields of Washington County and damage is apparent.



# FOREST AND SHADE-TREE INSECTS

## CANKERWORMS (Geometridae)

- aine. J. V. Schaffner, Jr. (June 12): A large area of oak and maple woodland between Biddeford and Kennebunk was severely injured by the fall cankerworm (Alsophila pometaria Harr.).
- Massachusetts. A. I. Bourne (June 25): Cankerworms were more abundant than usual generally over the State and their work was quite conspicuous at many points. A serious outbreak was found in southern Berkshire County, where the insects caused almost complete defoliation of many of the large elms, particularly south of Great Barrington and along the Connecticut Border.
- Connecticut. W. E. Britton (June 22): Many elm and oak trees have been defoliated by the spring cankerworm (Paleacrita vernata Peck.), particularly in the northern and western parts of the State. Such a severe outbreak has not occurred in these sections in recent years, and property owners were unprepared for it. Specimens have been received from Bridgeport, Danbury, Litchfield, and Waterbury. Fall cankerworms have, as usual, been prevalent in the southern part of the State and some orchard, shade, and woodland trees have been defoliated.
- New York. R. D. Glasgow (June 17): Cankerworms (both species) have defoliated shade trees in parts of Albany County. The fall cankerworm has been much less abundant in Westchester County this year than during the last 4 or 5 years.
- M. Kisliuk (June 12): On May 30 severe damage to the foliage of various forest trees, particularly oak and maple, by the spring cankerworm was noted at the various New York State parks on Long Island. Many of the trees were nearly 75 percent defoliated and the larvae were so numerous that after a 5-minute walk through some of the forest lanes a person could pick from 25 to 100 larvae from his clothing.
- New Jersey. H. W. Allen (May 24): A heavy infestation of cankerworms, with complete defoliation of some oak and hickory noted on wooded hills north of Princeton.
- Ohio. T. H. Parks (June): Fall cankerworms and other species of span worms have caused serious defoliation of shade trees in western Ohio. While elms have been most seriously defoliated, hackberry oak, hickory, and maple are also affected. Some injury has also occurred to forest trees in northeastern Ohio.
- J. N. Knull (May 29): There is a severe infestation of cankerworms in the vicinity of Clifton, in Greene County. Many elm and apple trees are entirely defoliated. Honeylocust, wild cherry, and white oak also show severe defoliation. Calosoma willcoxii Lec. was present in large numbers feeding on the larvae.

Indiana. J. J. Davis (June 22): Spring cankerworms were more abundant and destructive in northern Indiana than for many years. Unsprayed apple orchards were commonly defoliated; among the shade trees, elm was most often defoliated.

Illinois. C. L. Metcalf (June 24): A threatening outbreak of fall cankerworm was reported from Cook and Lake Counties the last of May and the first of June. Apple, elm, hackberry, maple, oak, and hickory were being defoliated. Larvae submitted the first of June were approximately half grown.

Michigan. R. Hutson (June 20): The fall cankerworm has been very abundant in south-central Michigan. Elms were badly defoliated.

Wisconsin. E. L. Chambers (June 24): Shade trees, principally elm, maple, oak, and basswood, have been defoliated in large areas all over the State by A. pomataria.

Iowa. C. J. Drake (June 24): Cankerworms ( three or four species) have defoliated many elm and other trees throughout a large part of Iowa.

Nebraska. M. H. Swenk (June): The spring cankerworm was reported to be damaging elm trees in Howard and Custer Counties.

FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Maine. H. B. Peirson (June): Very severe outbreaks in southwestern, eastern, and northern Maine. East and north of Mt. Katahdin an area of 60,000 acres was defoliated.

New Hampshire. J. V. Schaffner, Jr. (June 4): At East Andover a severe infestation was noticed in a forest of mixed hardwoods.

Vermont. H. L. Bailey (June 18): Forest tent caterpillars completely defoliating many maple sugar orchards and street tree maples and some elms in the southern half of the State. Many dead larvae were seen on tree trunks in Addison County, apparently the result of wilt disease. Cocoons were found in considerable numbers on June 11. Pupation occurred from 1 to 2 weeks earlier than last year.

Massachusetts. A. I. Bourne (June 25): Tent caterpillars began to hatch about the 9th or 10th of April and have been unusually abundant, fully as abundant in the eastern part of the State as they were last year. Leaf injury has been considerable.

Connecticut. W. E. Britton (June 22): In Windsor, on June 4, moderate numbers of caterpillars were observed resting on the trunks of oak trees but leaf injury was slight. Gypsy moth scouts report this insect very abundant in the vicinity of Union City and Stafford. M. P. Zappe observed them as numerous in Canaan, Litchfield, Salisbury, Sharon, and Thompsonville.



New York. R. D. Glasgow (June 17): The forest tent caterpillar has been very abundant on shade trees in Albany, and on shade and forest trees in many places in eastern New York. Many trees have been defoliated in and about Keene and Keene Valley in Essex County.

N. Y. State Coll. Agr. News Letter (June 8): Tent caterpillars of the forest-tree species are abundant in many prune and apple orchards in Niagara County.

Michigan. R. Hutson (June 20): The forest tent caterpillar is abundant over the northern end of the Lower Peninsula and the eastern half of the Upper Peninsula.

Minnesota. A. G. Ruggles (June): The northern third of the State, with the exception of Red River Valley, is overrun with M. disstrig. In the Arrowhead section around Ely and Tower they are very abundant, but the eastern end of Cook County has the worst devastation ever seen there. Everything is alive with caterpillars. Poplar is the choice food in this county, while basswood is the choice in Ottertail County.

#### FALL WEBWORMS (Hyphantria spp.)

Maine. H. B. Peirson (June 15): Moths of the fall webworm (H. textor Harr.) are flying at Houlton.

Maryland. G. Myers (June 25): The fall webworm has appeared on several fruit and shade trees with several webs on each tree at Avery, 2½ miles east of Rockville. Several caterpillars, which were almost grown and had evidently fallen from a tree, were feeding on the leaves of hollyhock.

Georgia. O. I. Snapp (June 25): Fall webworms are appearing on pecan trees at Fort Valley.

Alabama. J. M. Robinson (June 24): The first brood of fall webworms has appeared on pecans at Auburn, Seale, and Pittsview.

Mississippi. C. Lyle (June 25): The fall webworm was reported to be rather generally distributed in the southeastern part of the State by June 15.

#### SATIN MOTH (Stilpnotia salicis L.)

New Hampshire. L. H. Werthley (June 16): District inspectors report heavy feeding by larvae in southern and central New Hampshire, and a considerable increase in the number of larvae of this species, as compared with last year.

Connecticut. W. E. Britton (June 22): All poplar trees in Waterbury and one in Bridgeport reported to be infested.



BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

Maine. H. B. Peirson (June 12): Heavy infestations of the beech scale are occurring in Washington County.

CARAGANA

A BLISTER BEETLE (Pyrota engelmanni Lec.)

Nebraska. M. H. Swenk (May 21): Specimens of Engelmann's blister beetle were received from Box Butte County on May 21, having been taken from caragana trees, which they were injuring.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

New Hampshire. J. V. Schaffner, Jr. (June 13): Adults of the elm leaf beetle were very common on elm foliage at Hampton on June 2.

Massachusetts. J. V. Schaffner, Jr. (June 13): Adults issued from hibernation in large numbers at Woburn between May 8 and 22. P. A. Berry notes that the infestations at North Attleboro, Middleboro, Weymouth, and Woburn still persist and that adults, eggs, and larvae were observed in these localities from June 8 to 10. Severe infestations have occurred here for the last 4 or 5 years.

Delaware. L. A. Stearns (June 16): Report of injury and specimens at Laurel.

Pennsylvania. H. E. Hodgkiss (June 23): The elm leaf beetle is very destructive. In Franklin County eggs are being laid and are hatching.

Tennessee. G. M. Bentley (June 20): Elm leaf beetle has appeared in several elm trees in the city parks of Nashville.

Ohio. T. H. Parks (June 8): No serious damage has come from this insect, but newly hatched larvae were observed feeding at Columbus on June 8.

Indiana. J. J. Davis (June 22): The elm leaf beetle was reported on June 20 as defoliating large elms on a farm 6 miles southwest of Corydon, Harrison County. This is the first authentic report of this insect in Indiana since we began keeping records in 1920. This is the third year of defoliation by these insects, according to the report received.

Idaho. R. W. Haegele (June 15): Severe infestations in most communities of southwestern Idaho, necessitating the spraying of elms. Larvae have been hatching since the last week in May.

California. C. S. Morley (June 4): Considerable injury to elm trees caused by the elm leaf beetle.

MOURNING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Maine. H. B. Peirson (June): Light infestation of spiny elm caterpillar at Augusta on elm.

Massachusetts. E. P. Felt (June 24): Spiny elm caterpillar was reported as somewhat injurious on a Pittsfield estate.

Wisconsin. C. L. Fluke (June 20): Spiny elm caterpillar is unusually abundant this spring in the vicinity of Madison, Dane County.

South Dakota. H. C. Severin (June 21): The caterpillar of the mourning-cloak butterfly is much more abundant than usual in the eastern part of the State.

Utah. G. F. Knowlton (June 11): Larvae have partially defoliated a number of Siberian and American elm trees at Logan.

WOOLLY ELM APHID (Eriosoma americanum Riley)

Rhode Island. A. E. Stone (June 22): Woolly aphids on elms have been unusually abundant this season, probably owing to a long period of warm, dry weather.

Wisconsin. E. L. Chambers (June 24): Elm leaves infested with the woolly aphid received in large numbers from all sections of the State. Lack of rain has apparently given them an unusually favorable season for their development.

Nebraska. M. H. Swenk (June): Numerous reports of injury to elm trees by the woolly elm aphid were received from May 21 to June 20, chiefly from Washington, Boone, Howard, Hall, Valley, Holt, and Hayes Counties.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

New York. R. D. Glasgow (June 17): The European elm scale is reported as abundant on elms in parts of Bronxville and also in parts of Albany.

R. E. Horsey (June): European elm scale was common and noticeable on twigs and branches of a number of elms in Rochester.

Ohio. T. H. Parks (June): This insect is as abundant as usual. The first young appeared during the week of June 15.

Wisconsin. E. L. Chambers (June 24): The European elm scale, not widely distributed in southern Wisconsin, is being observed at additional points but is not known to be present in more than 20 localities.

Iowa. C. J. Drake (June 24): The European elm scale is unusually abundant in the southern half of the State. Some trees at Harlan have been badly injured.

Utah. G. F. Knowlton (June 11): European elm scale is killing many branches on large ornamental elms at Logan.

### HICKORY

#### HICKORY PHYLLOXERA (Phylloxera caryaecaulis Fitch)

Connecticut and New York. E. P. Felt (June 24): The hickory leaf stem gall occurs in small numbers here and there in southwestern Connecticut and in southeastern New York.

R. E. Horsey (June): Hickory gall aphid is very abundant and disfiguring on native hickory trees at Rochester.

Ohio. T. H. Parks (June): We have received specimens of injury from several widely separated localities. It seems to be more abundant than usual.

Mississippi. C. Lyle (June 25): P. caryaecaulis was collected from hickory at Booneville on May 25.

### LARCH

#### LARCH CASE BEARER (Coleophora laricella Hbn.)

New York. R. D. Glasgow (June 17): The larch case bearer has been more than ordinarily injurious to tamarack this spring in northern New York forests, the first foliage in large areas having been destroyed. Many trees are dead or dying as a result of repeated annual defoliation.

New England. J. V. Schaffner, Jr. (June 12): The larch case bearer infestations in general are much lighter throughout New England this year; however, in some localities in Maine and New Hampshire and around Lake Placid and Saranac in New York some foliage has been severely browned.

#### LARCH SAWFLY (Lygaeonematus erichsonii Htg.)

Maine. H. B. Peirson (June 13): Adults of the larch sawfly have been observed flying in several places in Washington County.

Pennsylvania. H. E. Hodgkiss (June 23): The larch sawfly is abundant and has caused serious damage.

### MAPLE

#### COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Indiana. J. J. Davis (June 22): Cottony maple scale is showing up destructively in the northern half of the State. This is the first time for some years that this scale has been conspicuous.

Mississippi. C. Lyle (June 25): Specimens were received from Marks on May 27 and the pest was observed at Macon on June 4.



outh Dakota. H. C. Severin (June): This scale is exceedingly abundant in South Dakota. Many trees and vines look as if they were entirely covered with a coating of popcorn.

braska. M. H. Swenk (June): Reports of damage to maple and other trees were received from Dawson and Custer Counties.

OBSURE SCALE (Chrysomphalus obscurus Comst.)

ennessee. G. M. Bentley (June 20): Obscure scale is a very common pest of sugar maple in all parts of Tennessee.

OAK

CALIFORNIA OAK WORM (Phryganidia californica Pack.)

alifornia. R. E. Campbell (June 10): Complaints have been received of the California oak moth attacking oak trees in Alhambra and vicinity. A number of fine old trees on a golf course have been partially defoliated.

PINE

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

Massachusetts. J. V. Schaffner, Jr. (June 12): The infestations of European pine shoot moth seem to persist only in plantings of pine near the sea-shore or on low-growing pines, such as Pinus montana mughus, a few miles inland. At Forest Hills a large ornamental planting of Scotch pine intermixed with mughus pine is seriously infested, while a plantation of red pines a few hundred feet away, which was heavily infested prior to 1934, is now free from infestation.

onnecticut. J. V. Schaffner, Jr. (June 12): In southwestern Connecticut some plantations were found heavily infested this spring.

ew York. J. V. Schaffner, Jr. (June 12): In the southern half of Westchester County and on Long Island, some plantations were found to be heavily infested.

R. D. Glasgow (June 17): The European pine shoot moth has shown a remarkable recovery this spring in the lower Hudson Valley. While enormously abundant and destructive a few years ago in parts of Westchester County, of the lower Hudson Valley, and of Long Island, this insect was greatly reduced in numbers by the unusually cold winter of 1934. Larvae and pupae were still relatively rare on untreated trees in the spring of 1935 and later in the same year eggs were difficult to find where hundreds were found 2 years ago. On June 10, however, a count on 10 young untreated trees in Westchester County revealed an average of between 86 and 87 living larvae and pupae per tree.

New Jersey. J. V. Schaffner, Jr. (June 12): At New Vernon and Washington's Crossing, light-to-medium infestations occurred in red pine plantations.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

Ohio. T. H. Parks (June): Larvae with injured pine terminals were received from Portage County in June.

A NEEDLE MINER (Paralechia pinifoliella Chamb.)

New England. J. V. Schaffner, Jr. (June 12): In May and early in June severe local infestations were noted on Pinus rigida at Ogunquit and Kennebunk, Maine, Lexington and West Boylston, Mass., and Burrillville, R. I.

PALES WEEVIL (Hylobius pales Boh.)

New York. R. D. Glasgow (June 17): The pales weevil continues to be a major pest in many parts of eastern and southeastern New York. Serious injury or death to many mugho and other pines in nurseries, ornamental plantings, and reforested areas has been caused by the larvae working just below the surface of the ground.

WHITE GRUBS (Phyllophaga spp.)

Rhode Island. A. E. Stene (June 22): A white pine nursery in Providence County reports considerable damage by white grubs in seed beds. Heavy infestation of the grub have also been found in some lawns of the same county.

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Massachusetts. A. I. Bourne (June 25): Pine leaf scale was hatching from May 12 to 14, fully a week ahead of the usual date.

New York. R. D. Glasgow (June 17): The pine needle scale is abundant and injurious on mugho and other ornamental pines in various parts of the Hudson Valley.

Nebraska. M. H. Swenk (June 1): The pine leaf scale was found attacking spruce trees in Dixon County on June 1.

A SCOLYTID (Ips calligraphus Germ.)

Mississippi. C. Lyle (June 25): Beetles were very numerous on pines at Ocean Springs on June 16. Injury to pines in Harrison County last month (see June 1936 Bul., p. 140) attributed to the southern pine beetle (Dendroctonus frontalis Zimm.) has now been determined as due to this insect.

SOUTHERN MOLE CRICKET (Scapteriscus acletus R. & H.)

Texas. T. E. Snyder (May 18): These mole crickets damaged pine seedlings in a nursery at Conroe, Montgomery County. (Det. A. B. Gurney.)

POPLAR

POPLAR LEAF BEETLE (Phytodecta pallida L.)

Minnesota. A. G. Ruggles (June 20): Several areas at Cloquet and Tower had quite an infestation of this insect on poplar.

SPRUCE

EUROPEAN SPRUCE SAWFLY (Neodiprion polytomum Htg.)

Maine. H. B. Peirson (June 12): Larvae feeding in a fairly heavy outbreak. (June 12-20): Larvae found feeding in 24 towns scattered throughout eastern and northern Maine.

I N S E C T S   A F F E C T I N G   G R E E N H O U S E

A N D   O R N A M E N T A L   P L A N T S

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. M. P. Zappe (June 22): Adults are beginning to emerge. Larvae and pupae very abundant in soil at Stratford; not quite so abundant in Sharon.

SAY'S BLISTER BEETLE (Pomphopoea sayi Lec.)

New Hampshire. E. P. Felt (June 24): Say's blister beetle was reported as injuring cherry and shrubbery at Etna.

Connecticut. M. P. Zappe (June 11): Heavy infestation but confined to small area in Sharon. All blossoms of lupins eaten in several lawns. Nearly 2 gallons of adults were collected.

A BLISTER BEETLE (Macrobasis torsa Lec.)

Connecticut. W. E. Britton (June): This beetle is a new pest in Connecticut and had partially defoliated a hercules club plant at Derby by June 3. A specimen was received from Ridgefield on June 19.

CUBAN-LAUREL THRIPS (Gynaikothrips uzeli Zimm.)

Florida. J. R. Watson (June 22): Cuban-laurel thrips have been very destructive wherever Ficus religiosa and F. benjamina are used as ornamentals.

A COCCID (Margarodes spp.)

Florida. J. R. Watson (June 22): Ground pearls were reported injuring a lawn of centipede grass in Highlands County.



ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuicella Pack.)

New York. R. D. Glasgow (June 17): The arborvitae leaf miner, which appears to be generally distributed, even in deep forests, is a major pest of arborvitae in some nurseries and ornamental plantings in the Hudson Valley.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Ohio. E. W. Mendenhall (June 10): The euonymus scale is found infesting mountain ash in a nursery in Chillicothe.

Mississippi. Jack Milton (June 25): Very abundant in Jackson. Some plants were almost dead because of a heavy infestation. Reported from Leland on June 12.

HONEYSUCKLE

AN APHID (Rhopalosiphum melliferum Hottes)

New York. R. E. Horsey (June): Aphids (Hyadaphis xylosteri Schr.) were very numerous on young shoots and flower buds of Lonicera spp. Flower buds were stunted and only a few flowers opened on June 9.

JUNIPER AND CEDAR

A SCALE INSECT (Aspidiotus coniferarum Ckll.)

Mississippi. G. L. Bond (Feb. 24): Specimens of this scale on cedar were collected at Moss Point in February. (Det. by H. Morrison.)

OLEANDER

OLEANDER CATERPILLAR (Syntomeida epialis Walk.)

Florida. J. R. Watson (June 22): The oleander caterpillar is extremely abundant and destructive from St. Petersburg south. It has not reappeared in the Gainesville section since its extermination by the cold winter of 1934.

PRIVET

A MITE (Eriophyes sp.)

New Jersey. H. W. Allen (May 24): There is at present a heavy infestation of a mite on privet in Moorestown, resulting in a noticeable stunting of the young terminals and uneven growth of hedges.

RHODODENDRON

RHODODENDRON LACEBUG (Stephanitis rhododendri Horv.)

New York. R. E. Horsey (June): Considerable numbers of the first brood of the rhododendron lacebug, both young and winged adults, found on rhododendron on June 20.

ROSE

ROSE CURCULIO (Rhynchites bicolor Fab.)

Massachusetts. H. R. Bryson (June 23): Rose curculio is more abundant this year than ever before recorded or observed at Manhattan. Cultivated roses have been attacked.

RASPBERRY CANE BORER (Oberea bimaculata Oliv.)

Virginia. H. G. Walker (June 24): Several people have reported that their roses were being injured by the raspberry cane borer.

ROSE SAWFLY (Caliroa aethiops Fab.)

Ohio. E. W. Mendenhall (May 30): The European rose slug is very abundant on rose plants in Columbus and vicinity. The plants showed considerable damage.

Tennessee. G. M. Bentley (June 20): Uncared-for roses are having a heavy infestation of the rose sawfly this year.

THRIPS (Thysanoptera)

Tennessee. G. M. Bentley (June 20): The blooms of outdoor-grown roses this year have been generally infested with thrips, which caused the flowers to shatter shortly after opening.

TAXUS

BLACK VINE WEEVIL (Brachyrhinus sulcatus Fab.)

Connecticut. E. P. Felt (June 24): The black vine weevil was reported as injurious to Taxus at Bethel.

New York. R. D. Glasgow (June 17): The Taxus weevil, which for some years has been very injurious to yew in nurseries, has been reported this spring from various parts of New York to be causing heavy losses of valuable Taxus trees and hedges in ornamental plantings.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

MOSQUITOES (Culicinae)

Indiana. J. J. Davis (June 22): Mosquito abundance continues to be reported from various localities in the State.

Oregon. H. H. Stage (May 28): Aedes aldrichi Dyar and Knab, and A. vexans Meig. emerged in numbers along the Columbia River beginning May 11.

SANDFLIES (Culicoides spp.)

Georgia. J. B. Hull (June 25): Along the Georgia coast sand flies continued to be numerous around the salt marshes on warm nights when there was little breeze. C. dovei Hall and C. canithorax Hoffm. were found in greatest numbers this month, C. dovei constituting about 75 percent and C. canithorax over 24 percent. Only a few C. melleus Coq. have been collected.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Massachusetts. F. C. Bishopp and C. Smith (June 20): A single adult was taken on a cottontail rabbit, this being the first record of the rabbit as host for the adult of this tick. New host records for immature stages of this species were the gray rat, the jumping mouse (Zapus hudsonius), and sheep.

Illinois. C. L. Metcalf (June 24): The dog tick (D. variabilis) seems to have been more than usually common in central Illinois this spring.

A TICK (Ornithodoros turicata Duges)

Florida. T. F. McGehee (June 25): The relapsing-fever tick was found in the loose sand and debris on the floor of two lime sinks in the vicinity of O'Brien, Suwannee County, on May 21. A survey of the area by Homer Hixson from June 5 to 11 showed about 30 percent of the sinks to be rather heavily infested.

CATTLE

HORN FLY (Haematobia irritans L.)

Massachusetts. F. C. Bishopp and C. Smith (June 19): Horn flies causing some annoyance to cattle in the Buzzards Bay district and on Martha's Vineyard. The number of flies per animal ranged from 10 to 250.

Iowa. R. W. Wells (May 15): Hornflies appeared at Ames about May 15.



Missouri. L. Haseman (June 24): Since June 15 the hornfly in central Missouri has been unusually abundant and vicious.

SCREW WORM (Cochliomyia americana C. & P.)

Oklahoma. R. Melvin (June 25): One adult was captured in a trap at Lawton during the week of May 27 to June 3.

Texas. R. Melvin (June 25): The first infestations this season in Parker and Dallas Counties were reported on June 5 and June 15, respectively.

STABLE FLY (Stomoxys calcitrans L.)

Iowa. R. W. Wells (June 1): The first seasonal appearance of the stable flies was noticed about May 15, but they have not become annoyingly abundant.

Missouri. L. Haseman (June 24): Since June 15 the stable fly has been unusually abundant and vicious in central Missouri.

BUFFALO GNATS (Simulium spp.)

New York. R. D. Glasgow (June 17): Black flies were reported on May 29 to have been interfering with W. P. A. work in Bear Mountain Park in southeastern New York. However, they are apparently far less abundant this year than usual in Lake Placid area, northern New York. The section has been dry, streams are low, few pupae and fewer larvae were observed on June 15, and empty cocoons indicated that emergence is practically complete in the area named.

GULF COAST TICK (Amblyomma maculatum Koch)

Georgia. Homer Hixson (June 25): Examination of meadowlarks at Valdosta, one of the principal hosts of the immature stages of this species of tick, indicate that nymphs were no longer active on May 27. Examinations of sheep and other animals show that infestations with the adult ticks are increasing.

HORSE

HORSEFLIES (Chrysops spp.)

Delaware. L. A. Stearns (May 27): C. plangens Wied. and C. flavidus Wied. are numerous and causing great annoyance to man and livestock at Odessa.

# HOUSEHOLD AND STORED-PRODUCTS INSECTS

## TERMITES (Reticulitermes spp.)

- Massachusetts. A. I. Bourne (June 25): Many reports of termite damage have been received this season. Most of the complaints have been from the vicinity of Springfield, in southern Hampden County, although reports of rather serious damage have come from other parts of the State.
- Connecticut. N. Turner (June 24): Reported cases of damage decreased during June, since the flight season is about over.
- Minnesota. A. G. Ruggles (June): We have located some termites in Minnesota, damaging timbers of a house at Luverne.
- Iowa. H. E. Jaques (June 22): Many of the fences on a farm in Des Moines County are reported to be badly eaten by R. tibialis Bks.

## ANTS (Formicidae)

- Maine. H. B. Peirson (June): Many calls have been received of black carpenter ants (Camponotus herculeanus pennsylvanicus DeG.) invading homes and camps.
- Nebraska. M. H. Swenk (May 28): The black carpenter ant was reported working in a basement in Washington County. (June 6): The black garden ant (Formica fusca Hinds) was reported present in damaging numbers in the garden of a Dawes County correspondent. Complaints of the western harvester, or mound-building prairie ant (Pogonomyrmex occidentalis Cress.), working in gardens and fields were received during the latter part of May and the first few days of June from Franklin, Harlan, and Furnas Counties.
- Kansas. H. R. Bryson (June 19): Mound-building prairie ants are reported to be very destructive in alfalfa fields at Oakley, Brewster, Gem, and Beverly.
- South Dakota. H. C. Severin (June): Ants of several species have been giving considerable trouble because of their invasion of flowers.

## PEA WEEVIL (Bruchus pisorum L.)

- Georgia. T. L. Bissell (June 25): Weevils emerged today from pods of Austrian winter pea picked at Griffin on June 11.

## A CLOTHES MOTH (Tineola uterella Walsingham)

- Florida. J. R. Watson (June 22): Has been reported in a few localities, although the numbers are much smaller than during the last few years, probably because the species was heavily parasitized last year.

## THE SPECIES AND DISTRIBUTION OF GRASSHOPPERS IN THE 1935 OUTBREAK

Robert L. Shotwell, Entomologist

In the adult-grasshopper survey conducted late in the summer and early in the fall of 1935, specimens were collected in typical environments. These specimens were counted to determine the percentages of each species in the total number taken in each habitat. Similar collections were made in the summer of 1934 in four States -- North Dakota, South Dakota, Montana, and Wyoming -- and the results were published as supplement 9, volume 14, of the Insect Pest Survey Bulletin. In 1935, this work was expanded to include even additional States -- Colorado, Iowa, Michigan, Minnesota, Nebraska, Utah, and Wisconsin.

## Natural Vegetation Areas in Which Collections Were Made

The general types of vegetation areas in which collections were made are outlined and the important plants listed below. 1/

- Northeastern pine forest (jack, red, and white pines)--Wisconsin and Michigan.
- Northeastern hardwoods (birch, beech, maple, hemlock)--Wisconsin and Michigan.
- Southern hardwood (oak and hickory)--Wisconsin and Michigan.

Other plants found in Wisconsin and Michigan areas include:

Grasses: Quackgrass (Agropyron repens), cheat (Bromus secalinus), downy brome (P. tectorum), green and yellow foxtail (Chaetochloa viridis and C. glauca), squirreltail (Hordeum jubatum), ticklegrass (Panicum capillare), witchgrass (P. virgatum), and Poa spp.

1/ The natural vegetation areas were described largely from the work of H. L. Shantz and Raphael Zon in the Atlas of American Agriculture, part 1, The Physical Basis of Agriculture, sect. E, Natural Vegetation (October 1924), issued by the United States Department of Agriculture, Bureau of Agricultural Economics, under the supervision of O. E. Baker. The collections were made by field agents of the Bureau of Entomology and Plant Quarantine, in cooperation with the various State entomological agencies.



Clovers: (Trifolium spp.).

Mustards: Ball (Neslia paniculata), tumbling (Morta altissima), hedge (Erysimum officinali), and tansy (Sophia incisa).

Other hosts are peppergrass (Lepidium spp.), chickweed (Stellaria media), pigweed or goosefoot (Chenopodium spp.), dock (Rumex spp.), mare's-tail (Leptilon canadense), goldenrod (Solidago), sticktight (Bidens spp.), cocklebur (Xanthium), ragweed (Ambrosia spp.), sowthistle (Sonchus spp.), wild lettuce (Lactuca spp.), dandelion (Leontodon spp.), plantain (Plantago spp.), Solanum spp., Verbena spp., dodder (Cuscuta spp.), and Mallow spp.

#### 4. Tall-grass prairies--

(a) Bluestem sod: All of Iowa, southern and western Minnesota, the extreme eastern part of the Dakotas, and Nebraska. Principal grasses are big bluestem (Andropogon furcatus), little bluestem (A. scoparius), Indian grass (Sorghastrum nutans), some buffalo grass (Buchloe dactyloides), and side-oats grama (Bouteloua curtipendula) in the western portion of the area, also quack-grass.

(b) Needlegrass; slender wheatgrass: Just west of bluestem sod area in the eastern part of the Dakotas and Nebraska. Principal grasses are needlegrass (Stipa spartea), slender wheatgrass (Acropyron paniculatum), Indian grass, buffalo grass, side-oats grama, and others.

Other plants in the tall-grass prairie areas are lambsquarters (Chenopodium); marsh-elder (Iva xanthifolia), frenchweed (Thlaspi arvense), peppergrass (Lepidium), small and giant ragweed (Ambrosia artemisiifolia and A. trifida), wild lettuce (Lactuca), wild licorice (Glycyrrhiza lepidota), smartweed (Polygonum), goldenrod (Solidago), gumweed (Grindelia squarrosa), sweetclover (Melilotus), Canada thistle (Cirsium arvense), dandelion (Leontodon), and mare's-tail (Leptilon canadense).

Along water courses and in gullies are the following important trees and shrubs: Elm (Ulmus), ash (Fraxinus), boxelder (Acer negundo), and oak (Quercus macrocarpa), Populus, chokecherry (Prunus virginiana), buckbrush (Symphoricarpos racemosus), Juneberry (Amelanchier canadensis), roses (Rosa), currants and gooseberries (Ribes), and hawthorn (Crataegus).

(c) Sandsage; sandgrass: Central Nebraska, Artemisia filifolia and Calamovilfa longifolia.

#### 5. Short-grass, or plains grassland.

(a) Grama grass and western needlegrass: Western North Dakota, part of eastern and extreme northeastern Montana, just east of the Missouri River and north of Moreau River in South Dakota. Principal grasses are grama (Bouteloua gracilis), western needlegrass (Stipa comata), junegrass (Koeleria cristata), and buffalo grass (Buchloe dactyloides). Other important plants are purple coneflower (Echinacea angustifolia), silvery psorale (Psoralea argophylla), sage (Artemisia spp.), and many of the plants from the tall-

(b) Western wheatgrass and sagebrush: Badlands of North Dakota, a large area extending diagonally from northwest to southeast in the eastern half of Montana and east of Big Horn Mountains, Wyoming, and extreme northwestern part of Dakota, all more or less broken country. Principal grasses are western wheatgrass (Agropyron smithii), niggerwool (Carex filifolia), Poa spp., Koleria, and Calamagrostis. Principal plants are sage (Artemisia cana and A. frigida), gumweed, buckbrush, and many other plants and shrubs common to the short-grass area.

(c) Grama grass: General eastern two-thirds of Montana east of Big Horn Mountains in Wyoming, extending to the Black Hills and down along the boundary between South Dakota and Wyoming, into Colorado close to the mountains. The principal grass is grama (Bouteloua gracilis). Other grasses are niggerwool (Carex filifolia), junegrass (Koleria cristata), and Poa spp. Prominent spring flowers are white mountain-lily (Lecicocrinum montanum), pasque flower (Pulsatilla hirsutissima), phlox (Phlox hoodii), wild onion (Allium textile), and ground daisy (Townsendia exscapa). Mountain sage (Artemisia frigida) is abundant with grass. In overgrazed or rocky or barren areas matchweed (Gutierrezia sarothra), Selaginella densa (club-foot moss), plantain (Plantago purshii), and Poa secunda are prominent. Along coulee bottoms is western wheatgrass (Agropyron smithii). The trees and shrubs are those common to the entire short-grass area.

(d) Grama grass and mountain sage: Along the eastern front of the mountains. Principal grasses and plants are grama grass (Bouteloua gracilis), niggerwool (Carex filifolia), mountain sage (Artemisia frigida), yarrow (Achillea millefolium), Eriogonum spp., penstemons, wild roses, and lupines.

(e) Grama and buffalo grass: Most of eastern Colorado, western Nebraska and a strip east and west, south of the White River in South Dakota. Occurring in equal quantities are grama grass (Bouteloua gracilis) and buffalo grass (Buchloea dactyloides). Other grasses under more moist conditions are western needlegrass (Stipa comata), wiregrass (Aristida longiseta), and sand sporobolus (Sporobolus cryptandrus). Most of the plants are low-growing and include plantain (Plantago purshii), annual fescue (Festuca octoflora), pennyroyal (Hedeoma pinnatifida), beggartick (Lappula occidentalis), scapweed or Spanish bayonet (Yucca glauca), pricklypear (Opuntia), and, where the soil is wetter, mare's-tail (Leontodon canadense), and gumweed (Grindelia squarrosa). Along the streams and rivers are species of Populus and Salix.

Southwestern Nebraska. An open cover of grama and scattered growth of wiregrass (Aristida longiseta). Scattered plants such as Psoralea tenuiflora and bush morning-glory (Ipomoea).

Yellow pine and Douglas fir forest --

On the eastern front of main range in Colorado. The chief trees are yellow pine (Pinus ponderosa) and Douglas-fir (Pseudotsuga) on the north slopes. In the southeastern part of the range is a pine (Pinus edulis). The grasses are grama (Bouteloua) and junegrass (Koleria cristata); numerous shrubs of the genera Rhus (sumac), Ribes (gooseberry and currant),



Cercocarpus (mountain mahogany), Crataegus (hawthorn), Rosa (rosebushes), and Prunus (chokecherry).

7. Montane (collections made only in Colorado)--

Represented by lodgepole pine (Pinus murrayana), Engelmann spruce (Picea engelmanni), Colorado blue spruce (P. pungens), and quaking aspen (Populus tremuloides). Along streams are found willow (Salix), birch (Betula), and honeysuckle (Lonicera). In the openings are sedges (Carex), sages (Artemisia), sandwort (Arenaria), lupines (Lupinus), shrubby cinquefoil (Dasiphora fruticosa), locoweed (Astragalus), larkspur (Delphinium), paintbrush (Castilleja), and many others.

8. Alpine meadows, above timber line --

Characterized by timber-line effects on Engelmann spruce, causing them to grow along the ground, dwarf willows, and other plants, monkshood (Aconitum), bluebell (Mertensia), sedges (Carex), phlox, goldenrod (Solidago), cowslip (Primula), gentian (Lasystephana), and many more.

9. Sagebrush, or northern desert shrub --

All of Wyoming west of Laramie and Big Horn Mountains, except the mountain areas and all of the Great Basin region in Utah. The plants are sages (Artemisia tridentata, A. nova, and A. rigida), salt sages (Atriplex corrugata, A. nuttallii, and allied species), matchweed (Gutierrezia sarothrae), big and little rabbitbrush (Chrysothamnus nauseosus and C. stenophyllis), winter fat (Eurotia lanata), and certain annuals, military grass (Bromus tectorum), alfilaria (Erodium cicutarium), and other desert species.

These natural vegetation areas overlap and the plants that dominate one area may be important throughout another. Most of the collections were made either in or close to cultivated crops. In some instances special effort were made to collect in the native environments away from the influence of cultivation.

The cropped area and pasture and hay grassland environments are varied because of differences of natural vegetation and climate. In the eastern and more humid portions of the survey territory, the fields are smaller and more cut up by fencerows and roadsides, and the bordering vegetation is much more rank and lush than in the drier, more arid western part. Therefore, a wheat field in eastern Montana furnishes a different environment than does a wheat field in Iowa, Wisconsin, or other States having greater rainfall. The grain fields in the more arid short-grass region are surrounded by large tracts of open range, and the populations there are influenced by the surrounding short-grass species of grasshoppers. The percentage of the total land area of the State in harvested crops is about 60 percent in Iowa and 4 percent in Montana. With the breaking up of the native vegetation into farms, many new plants have been introduced in the form of crops and weeds.



A study of the collections made in the different natural vegetation areas indicates that the greatest number of species occurred in the short-grass or plains-grassland region. Michigan and Wisconsin lie in the hardwood and pine-timber region, with rank vegetation. The collections from these States represented only 12 species. In the collections from Iowa, Minnesota, and other tall-grass prairie areas the number of species was 22. The collections from the western parts of the Dakotas, Nebraska, eastern Montana, Wyoming, and Colorado averaged about 44 species. At elevations of from 4,000 to 5,000 feet in Colorado or foothill region the number was 40; in the lower montane zone, from 6,000 to 7,500 feet, there were 32 species; from 8,000 to 8,500 feet there were 14; and above 10,500 feet there were only 5 species. These figures have only a relative significance and do not represent the actual number of species occurring in the natural vegetation areas. Utah in the northern desert-shrub region yielded 24 species.

When collections were made in a crop, special effort was made to sweep only in that crop. Field-margin collections were divided between soddy and weedy types. Pastures were fenced, and consisted of native or introduced grasses of relative small acreages surrounded by cultivated crops. The native grasslands were large tracts not affected by cultivation. For each State the total number of each species is shown as a percentage of the total number of specimens collected in the State during the survey. The relative distribution of species is listed for the States and the five most important species in each environment are also given.

It must be understood that the collecting was very general in character and not all the species are represented. In future work more attention will be paid to careful collecting in specific natural vegetation areas, as contrasted with introduced conditions. This should give some information relative to the effect of cultivation on grasshopper populations. When thousands of acres of lush grain appeared in the prairies of South Dakota, there came an enormous increase in population of Melanoplus differentialis Thos. and M. bivittatus Say, until in 1931 the herds of these pests stripped bare an area of 30,000 square miles. Then, as increasingly dry years followed, climaxed by the great drought of 1934 and the subsequent destruction of crops and depletion of native vegetation, these two species all but vanished. In 1935 along river courses, they are again staging a comeback in certain places.

### COLORADO

The collections in Colorado were made in 11 different environments, as shown in the table of the distribution of species. These represent the general habitats found on the plains, in the foothills, on the mountains, and in high mountain and alpine meadows. The elevations for these ranges from 3,500 to 12,200 feet. The annual precipitation ranges from 10 to 25 inches, with the rainfall increasing in amount and frequency with the increase in elevation. These natural vegetation zones are as follows:

#### 1. Plains--grama, buffalo grass association --

Dry and somewhat xerophytic, with an annual precipitation of about 10 inches.

2. Foothill region -- rock pine and Douglas-fir --

Elevation from 5,000 to 6,000 feet, approximately, with annual precipitation of 15 to 20 inches.

3. Low mountain -- 6,000 to 7,500 feet

4. High mountain -- 8,000 to 8,500 feet

5. Alpine -- 10,500 to 12,200 feet

Altogether, 3,257 specimens, including 58 species, were collected. The plains-grassland collection had the greatest number of species -- 37; the foothill region had 40; the lower montane zone had 32; the higher montane zone, 14; and the alpine, only 5. The 5 most important species for each habitat are listed.

The worst infestations in 1935 were in the north-central counties fringing the mountains, where succulent food was more abundant. In the more arid regions of the eastern counties severe drought, coupled with effective control campaigns, has greatly reduced the heavy populations that occurred in the severe outbreaks of 1930 and 1931. Melanoplus mexicanus Sauss. was first in numbers over the whole area. M. bivittatus and M. differentialis have fallen off, owing to drought and lack of succulent food.

Distribution by species of 3,257 specimens collected in Colorado, expressed in percentage of total number collected in each habitat

Species	Small grains side	Legumes	Foot-hill below 6,000 ft.	Low mt. 6,000-7,500 ft.	High mt. 10,500-12,200 ft.	Alpine Wood ches	Plains grass-land	River-bottom	Pasture grass-land	Total specimens	% of grand total
<i>Acrolophus hirtipes</i> Say----	--	--	--	--	--	0.37	--	0.61	--	2	0.06
<i>Acrolophus turnbullii</i> Thos.-----	10.36	3.73	1.97	.88	--	4.80	5.52	8.48	9.45	220	6.75
<i>Ageneotettix deorum</i> Scudd.-----	3.58	3.92	6.21	6.58	--	5.54	3.91	5.45	--	130	3.99
<i>Amphitornus bicolor</i> Thos.-----	--	--	.45	1.32	--	--	.23	1.21	--	7	.21
<i>Arphia pseudonietana</i> Thos.-----	.13	--	.15	.44	--	--	.23	1.21	--	5	.15
<i>Aulocara elliotti</i> Thos.-----	1.53	--	6.67	1.32	2.13	.74	10.34	.61	14.17	90	2.76
<i>Boopedon nubilum</i> Say-----	--	--	.15	--	--	--	--	--	--	1	.03
<i>Brachystola magna</i> Gir.-----	.64	.59	.15	--	--	--	.46	.61	--	13	.40
<i>Camula pellucida</i> Scudd.-----	1.66	.59	.45	25.44	18.52	--	9.23	5.45	--	80	2.46
<i>Chorthippus curtipennis</i> Harr.-----	--	.59	--	.88	57.78	--	--	3.03	.79	87	2.67
<i>Circotettix rabula</i> R. & H.-----	--	--	.30	--	--	.74	--	--	--	2	.06
<i>Cordillacris occipitalis</i> Thos.-----	--	.20	.15	--	--	--	--	--	--	1	.03
<i>Cratypedes neglectus</i> Thos.-----	--	--	--	2.19	3.70	--	--	--	--	5	.15
<i>Dactyloctenium pictum</i> Thos.-----	.13	--	.61	--	--	--	.46	--	2.36	6	.18
<i>Derotmema haydenii</i> Thos.-----	8.18	1.96	2.73	3.51	--	13.65	7.36	12.12	2.36	197	6.05
<i>Dissosteira carolina</i> L.-----	3.71	.59	1.67	.88	--	1.11	1.61	.61	--	58	1.78
<i>Dissosteira longipennis</i> Thos.-----	1.92	--	--	--	--	7.75	4.37	--	1.82	60	1.84
<i>Drepanopterna femeratum</i> Scudd.-----	.38	.59	.76	--	--	.37	.92	--	1.57	16	.49
<i>Encoptelophus costalis</i> Scudd.-----	.71	.20	.15	--	--	--	.23	--	--	5	.15
<i>Gomphoceris clavatus</i> Thos.-----	.13	--	.15	--	.74	38.03	--	--	--	11	.34
<i>Hadrotettix trifasciatus</i> Say-----	3.71	.39	2.27	.44	--	--	2.07	1.21	.79	53	1.63
<i>Hesperotettix brevipennis</i> Thos.-----	.13	--	--	--	--	--	--	--	--	1	.03
<i>Hesperotettix speciosus</i> Scudd.-----	.13	.20	1.21	.44	--	--	.23	--	--	4	.12
<i>Hesperotettix viridis</i> Thos.-----	1.02	--	3.18	.88	--	--	.92	1.21	.79	19	.58
<i>Hippiscus rugosus</i> Scudd.-----	--	--	--	.44	--	--	.23	--	--	1	.03
<i>Hypochlora alba</i> Dodge-----	--	--	--	--	--	--	--	--	.61	1	.03
<i>Melanoplus angustipennis</i> Dodge-----	2.81	.59	6.52	.88	--	7.01	1.15	--	--	58	1.78
<i>Melanoplus bivittatus</i> Say-----	3.96	19.22	7.73	10.96	2.22	8.49	2.07	6.67	.79	239	7.34
<i>Melanoplus bowditchi</i> Scudd.-----	.26	--	.30	--	--	--	--	--	--	2	.06



Species	Small grains	Roadside	Legumes	Foot-hill below 6,000 ft.	Low mt. 6,000-7,500 ft.	High mt. 8,000-12,500 ft.	Alpine 10,500-12,200 ft.	Weed patches	Plains grassland	River bottom	Pasture grassland	Total specimens	% of grand total
Melanoplus dawsoni Scudd.	--	--	--	--	.88	--	--	--	--	1.21	--	2	.06
Melanoplus differentialis Thos.	3.22	1.92	5.88	.61	1.32	--	--	1.11	.23	.61	--	102	3.13
Melanoplus dodgei Thos.	--	--	--	--	--	.74	53.19	--	--	--	--	27	.83
Melanoplus femur-rubrum DeG.	17.54	9.46	26.67	3.95	5.22	--	--	4.43	1.15	--	5.51	325	9.98
Melanoplus flavidus Scudd.	--	--	--	1.36	--	--	--	--	--	.61	--	4	.12
Melanoplus fluvialis Brun.	--	.26	.20	2.88	--	--	--	--	--	4.24	7.09	40	1.23
Melanoplus gladstoni Scudd.	2.37	4.48	.39	3.18	3.07	--	--	.74	2.76	5.45	1.57	82	2.52
Melanoplus infantilis Scudd.	--	--	.39	--	3.07	1.48	2.13	--	1.15	.61	--	18	.55
Melanoplus keeleri Thos.	--	.38	--	.45	--	--	--	--	--	--	--	3	.09
Melanoplus lakinus Scudd.	9.95	6.27	6.08	.76	.88	--	--	6.27	.92	2.42	1.57	154	4.23
Melanoplus mexicanus Sauss.	13.03	9.34	12.94	18.48	12.28	5.19	4.26	16.24	9.43	7.27	28.35	390	11.97
Melanoplus occidentalis Thos.	--	.38	--	1.36	1.75	1.48	--	--	1.38	.61	3.94	23	.71
Melanoplus packardii Scudd.	7.58	9.21	3.33	13.64	.88	2.22	--	6.27	13.79	6.06	13.39	266	8.17
Mermiria maculipennis Rehn	.24	--	--	.91	--	--	--	1.85	.23	--	--	7	.21
Mestobregma kiowa Thos.	.47	1.41	.59	2.12	3.95	--	--	3.22	2.00	--	--	48	1.47
Metator pardalinus Sauss.	.24	.51	--	1.21	--	--	--	--	1.38	--	--	11	.34
Opeia obscura Thos.	--	.51	.78	--	--	.74	--	--	1.15	1.82	--	17	.52
Philibostroma quadrimaculatum Thos.	.71	2.17	.39	2.58	1.75	--	--	1.85	11.26	2.42	1.57	89	2.73
Phoetaliotes nebrascensis Thos.	--	--	--	.15	--	--	--	.37	--	--	--	2	.06
Schistocerca lineata Scudd.	.24	--	--	--	--	--	--	--	--	--	--	1	.03
Spharagemon bolli Scudd.	.24	--	--	--	--	--	--	--	--	--	--	3	.09
Spharagemon collare Scudd.	3.79	.90	3.53	.91	.44	--	--	.74	--	1.21	--	48	1.47
Spharagemon equale Say	1.42	1.92	.59	1.21	.88	.74	--	1.85	2.30	1.82	3.14	51	1.57
Trimerotropis campestris McNeill	1.18	1.92	.39	.30	.44	.74	--	2.58	1.84	1.82	--	42	1.29
Trimerotropis formosus Day	.47	--	.20	--	--	--	--	.37	--	.61	.79	7	.21
Trimerotropis laticincta Sauss.	--	1.53	--	--	--	--	--	--	4.60	6.06	--	43	1.32
Trimerotropis pallidipennis Burm.	3.08	3.06	4.31	--	.44	--	--	3.32	.46	.61	--	75	2.30
Trimerotropis sparsa Thos.	--	--	--	--	--	3.07	--	--	--	--	--	5	.15
Trimerotropis suffusus Scudd.	--	--	--	--	.88	--	--	--	.46	--	--	2	.06
Total specimens per environment	422	782	510	660	228	135	47	271	435	165	127	--	--

Colorado

Plains grassland

Percent

1. *Melanoplus packardii*-----14
2. *Philibostroma quadrimaculatum* 11
3. *Aulocara ellioti*-----10
4. *Melanoplus mexicanus*----- 9
5. *Camula pellucida*----- 9
6. Thirty-two other species----47

Mountain, 7,000-7,500 feet

1. *Camula pellucida*-----25
2. *Melanoplus mexicanus*-----12
3. *Melanoplus bivittatus*-----11
4. *Ageneotettix deorum*----- 7
5. *Melanoplus femur-rubrum*---- 5
6. Twenty-seven other species--40

Alpine, above 10,500 feet

1. *Melanoplus dodgei*-----53
2. *Gomphocerus clavatus*-----39
3. *Melanoplus mexicanus*----- 4
4. *Melanoplus infantilis*----- 2
5. *Aulocara ellioti*----- 2
6. No others

Small grain

1. *Melanoplus femur-rubrum*----18
2. *Melanoplus mexicanus*-----13
3. *Melanoplus bivittatus*-----10
4. *Melanoplus lakimus*-----10
5. *Melanoplus packardii*----- 8
6. Twenty-four other species---41

Legumes

1. *Melanoplus femur-rubrum*----27
2. *Melanoplus bivittatus*-----19
3. *Melanoplus mexicanus*-----13
4. *Melanoplus lakimus*----- 6
5. *Melanoplus differentialis*--- 6
6. Twenty-five other species---29

River bottom

1. *Derotmema haydeni*-----12
2. *Aeoloplus turnbulli*----- 8
3. *Melanoplus mexicanus*----- 7
4. *Melanoplus bivittatus*----- 7
5. *Melanoplus packardii*----- 6
6. Twenty-seven other species--60

Foothill

Percent

1. *Melanoplus mexicanus*-----18
2. *Melanoplus packardii*-----14
3. *Melanoplus bivittatus*----- 8
4. *Aulocara ellioti*----- 7
5. *Melanoplus angustipennis*--- 6
6. Thirty-five other species---47

Mountain, 8,000-8,500 feet

1. *Chorthippus curtipennis*----58
2. *Camula pellucida*-----18
3. *Melanoplus mexicanus*----- 5
4. *Cratypedes neglectus*----- 4
5. *Trimerotropis sparsa*----- 4
6. Nine other species-----11

Pasture

1. *Melanoplus mexicanus*-----28
2. *Aulocara ellioti*-----14
3. *Melanoplus packardii*-----13
4. *Aeoloplus turnbulli*----- 9
5. *Melanoplus fluviatilis*----- 7
6. Sixteen other species-----29

Roadside

1. *Aeoloplus turnbulli*-----10
2. *Melanoplus femur-rubrum*---- 9
3. *Melanoplus mexicanus*----- 9
4. *Melanoplus packardii*----- 9
5. *Melanoplus lakimus*----- 6
6. Thirty-two other species---57

Weed patch

1. *Melanoplus mexicanus*-----16
2. *Derotmema haydeni*-----14
3. *Melanoplus bivittatus*----- 8
4. *Dissosteira longipennis*---- 8
5. *Melanoplus angustipennis*--- 7
6. Twenty-one other species---47

Percentage of grand total

1. *Melanoplus mexicanus*-----12
2. *Melanoplus femur-rubrum*----10
3. *Melanoplus packardii*----- 8
4. *Melanoplus bivittatus*----- 7
5. *Aeoloplus turnbulli*----- 7
6. Fifty-four other species---56



IOWA

All of the collections were made in the western third of the State. The whole of Iowa lies in the bluestem sod area of the tall-grass prairie region. Most of this original vegetation has been entirely replaced by cultivated crops and the country is cut up into small fields having a great length of fencerows, roadsides, and other types of field margin. About 60 to 70 percent of the total land area is under cultivation.

A total of 2,991 specimens were collected, representing 21 species taken in 5 habitats. This is only about half the number of species taken in the short-grass region. The distribution of the 5 most important species is given for each habitat. Melanoplus femur-rubrum was, perhaps, the most numerous species. M. mexicanus was second. There was a rather even distribution of grasshoppers over some 27 counties in the western third of the State. This is an increase over last year.

Iowa

Small grains

	<u>Percent</u>
1. <u>Melanoplus mexicanus</u> -----	59
2. <u>Melanoplus femur-rubrum</u> ----	24
3. <u>Melanoplus differentialis</u> --	5
4. <u>Ageneotettix deorum</u> -----	4
5. <u>Melanoplus packardii</u> -----	2
6. Six other species-----	6

Roadside

	<u>Percent</u>
1. <u>Melanoplus femur-rubrum</u> -----	84
2. <u>Melanoplus mexicanus</u> -----	12
3. <u>Melanoplus differentialis</u> ---	2
4. <u>Melanoplus bivittatus</u> -----	1/2
5. <u>Brachystola magna</u> -----	1/2
6. Five other species-----	1

Legumes

1. <u>Melanoplus femur-rubrum</u> ----	60
2. <u>Melanoplus mexicanus</u> -----	36
3. <u>Ageneotettix deorum</u> -----	2
4. <u>Melanoplus differentialis</u> --	1
5. <u>Melanoplus bivittatus</u> -----	1/2
6. Six other species-----	1/2

Weed patch

1. <u>Melanoplus mexicanus</u> -----	65
2. <u>Melanoplus femur-rubrum</u> ----	28
3. <u>Ageneotettix deorum</u> -----	5
4. <u>Melanoplus differentialis</u> ---	2

Pasture

1. <u>Melanoplus mexicanus</u> -----	65
2. <u>Melanoplus femur-rubrum</u> ----	24
3. <u>Ageneotettix deorum</u> -----	6
4. <u>Melanoplus differentialis</u> --	2
5. <u>Dissosteira carolina</u> -----	1
6. Nine other species-----	2

Percentage of grand total

1. <u>Melanoplus femur-rubrum</u> ----	52
2. <u>Melanoplus mexicanus</u> -----	41
3. <u>Ageneotettix deorum</u> -----	3
4. <u>Melanoplus differentialis</u> ---	2
5. <u>Dissosteira carolina</u> -----	1
6. Sixteen other species-----	1



Distribution by species of 2,991 specimens collected in Iowa, expressed in percentage of total number collected in each habitat.

Species	Small grains	Road-side	Legumes	Weed patches	Pasture grass-land	Total specimens	Percentage of grand total
Ageneotettix deorum Scudd.----	4.39	0.15	1.74	4.99	5.63	81	2.71
Brachystola magna Gir.-----	--	.31	--	--	--	2	.07
Chorthophaga australior R. & H.	--	--	.08	--	--	1	.03
Dissosteira carolina L.-----	1.75	.15	.25	--	.51	12	.40
Drepanopterna femoratum Scudd.	--	--	--	--	.13	1	.03
Encoptolophus costalis Scudd.--	--	.15	--	--	.26	3	.10
Encoptolophus sordidus Burm.--	--	--	--	--	.13	1	.03
Hesperotettix speciosus Scudd.	.44	--	--	--	--	1	.03
Hesperotettix viridis Thos.----	.44	--	--	--	--	1	.03
Hippiscus rugosus Scudd.-----	.88	--	.08	--	.13	4	.13
Melanoplus bivittatus Say-----	.88	.46	.25	--	.13	10	.30
Melanoplus differentialis Thos.	5.26	2.30	1.08	2.25	2.43	67	2.24
Melanoplus femur-rubrum DeG.--	24.12	84.53	59.78	28.09	23.56	1556	52.02
Melanoplus infantilis Scudd.--	--	--	--	--	.13	1	.03
Melanoplu mexicanus Sauss.-----	59.21	11.64	36.07	65.17	64.92	1218	40.72
Melanoplus packardii Scudd.----	2.19	--	--	--	--	5	.17
Mermiria neomexicana Thos.-----	--	--	--	--	.13	1	.03
Mestobregma kiowa Thos.-----	.44	--	.17	--	.26	5	.17
Schistocerca americana Drury--	--	.15	--	--	--	1	.03
Schistocerca lineata Scudd.----	--	.15	.17	--	--	3	.10
Syrbula admirabilis Uhler-----	--	--	.17	--	.13	3	.10
Total specimens per environment:	228	653	1206	89	781	--	--

## MICHIGAN

A portion of the State lies in the northeastern pine forest region, part in the northeastern hardwoods, and part in the southern hardwoods. The densest white pine forests in the country were once found on the sandy loam soils of Michigan. Most of these have been denuded, leaving large areas of cut-over stump grasslands which form ideal breeding grounds for Cannula pellucida and M. mexicanus under combined conditions of drought and overpasturing. Some 250 species of weeds and grasses are listed for this State and they abound in these stump lands. They are listed mostly as to genera under the natural vegetation of this State.

Most of the collections were made in some type of grassland, small grains and legumes being the only crops included. Some 6,673 specimens, representing 12 species, were collected. The number of species here is about one-fourth that of the short-grass region, one-half that of the tall-grass prairie, and about equal to the number of species found at elevations of 8,500 feet and higher in Colorado. The amount of plant cover has something to do with the population and variety of species, the denser the cover the less the population and the number of species.

In all of the collections M. mexicanus made up 72 percent of the total. This species was dominant by far in both the Upper and Lower Peninsulas. C. pellucida was second, being more numerous in the Upper Peninsula. M. femur-rubrum was probably third in numbers, at least in the Upper Peninsula, with Agencotettix deorum in about equal numbers in the Lower Peninsula.

In 1934 C. pellucida outnumbered M. mexicanus two to one in the Upper Peninsula, but in 1935 M. mexicanus outnumbered C. pellucida more than three to one. Cold rains and foggy weather during the hatching season reduced all grasshopper populations here and more especially C. pellucida. In the Lower Peninsula, M. mexicanus outnumbered C. pellucida ten to one. The average infestation in the Upper Peninsula in 1934 was about 2.5 times as great as in 1935. In the Lower Peninsula, that is in 30 counties in the upper half, the 1935 infestation is about 25 times as great as in 1934.

Distribution by species of 6,673 specimens collected in Michigan, expressed in percentage of total number collected in each habitat.

Species	Pasture	Mixed	Small grains	Hay	Quack grass	Cut over	Legumes	Waste, wild, and abandoned land	Total Specimens	Percentage of grand total
<i>Agneotettix doorum</i> Scudd.	4.00	1.26	1.59	--	--	16.67	2.75	10.30	295	4.42
<i>Arphia pseudonietana</i> Thos.	3.93	1.38	3.17	1.45	1.16	6.32	1.18	3.94	226	3.39
<i>Camula pellucida</i> Scudd.	11.75	3.27	9.52	10.00	13.18	.77	1.96	4.22	602	9.02
<i>Chorthippus curtipennis</i> Harr.	.31	.25	--	1.27	3.10	--	.78	--	31	.46
<i>Dissosteira carolina</i> L.	.51	.63	1.59	1.09	--	--	1.18	--	35	.52
<i>Encyrtolophus sordidus</i> Burm.	.82	1.51	7.94	.18	1.16	.77	1.57	3.03	71	1.06
<i>Melanoplus bivittatus</i> Say	.26	.63	1.59	4.00	.39	.19	7.45	--	59	.88
<i>M. dawsoni</i> Scudd.	2.18	--	--	.36	--	1.15	.78	.91	98	1.47
<i>M. femur-rubrum</i> DeG.	4.75	8.93	4.76	10.18	5.81	--	27.06	--	399	5.98
<i>M. mexicanus</i> Sauss.	70.40	81.76	69.84	70.91	74.03	73.95	52.94	77.27	4797	71.89
<i>Schistocerca alutacea</i> Harr.	.69	--	--	.18	1.16	--	.39	.30	33	.49
<i>Sparganemon collaris</i> Scudd.	.41	.38	--	.36	--	.19	1.96	--	28	.42
Total specimens per environment	3,898	795	63	550	258	522	255	330	--	--



Michigan

Pasture

Percent

1. Melanoplus mexicanus-----	70
2. Cammula pellucida-----	12
3. Melanoplus femur-rubrum-----	5
4. Ageneotettix deorum-----	4
5. Arphia pseudonietana-----	4
6. Seven other species-----	5

Mixed

1. Melanoplus mexicanus-----	82
2. Melanoplus femur-rubrum-----	9
3. Cammula pellucida-----	3
4. Encoptolophus costalis-----	2
5. Arphia pseudonietana-----	1
6. Five other species-----	3

Small grain

1. Melanoplus mexicanus-----	70
2. Cammula pellucida-----	10
3. Encoptolophus sordidus-----	8
4. Melanoplus femur-rubrum-----	5
5. Arphis pseudonietana-----	3
6. Three other species-----	4

Hay

1. Melanoplus mexicanus-----	71
2. Melanoplus femur-rubrum-----	10
3. Cammula pellucida-----	10
4. Melanoplus bivittatus-----	4
5. Arphia pseudonietana-----	1
6. Six other species-----	4

Quackgrass.

Percent

1. Melanoplus mexicanus-----	74
2. Cammula pellucida-----	13
3. Melanoplus femur-rubrum-----	6
4. Chorthippus curtipennis-----	3
5. Encoptolophus costalis-----	1
6. Three other species-----	3

Cut-over

1. Melanoplus mexicanus-----	74
2. Ageneotettix deorum-----	17
3. Arphia pseudonietana-----	6
4. Melanoplus dawsoni-----	1
5. Encoptolophus sordidus-----	1
6. Three other species-----	1

Legumes

1. Melanoplus mexicanus-----	53
2. Melanoplus femur-rubrum-----	27
3. Melanoplus bivittatus-----	7
4. Ageneotettix deorum-----	3
5. Cammula pellucida-----	2
6. Six other species-----	8

Waste, Wild and Abandoned Land

1. Melanoplus mexicanus-----	77
2. Ageneotettix deorum-----	10
3. Cammula pellucida-----	4
4. Arphia pseudonietana-----	4
5. Encoptolophus sordidus-----	3
6. Two other species-----	2

Percentage of grand total

Percent

1. Melanoplus mexicanus-----	72
2. Cammula pellucida-----	9
3. Melanoplus femur-rubrum-----	6
4. Ageneotettix deorum-----	4
5. Arphia pseudonietana-----	3
6. Seven other species-----	6

## MINNESOTA

All of the collections from Minnesota were made in the western part of the State. This lies in the bluestem sod area of the tall-grass prairie region. The important grasses and other plants are those common to this natural vegetation area.

There were 3,896 specimens altogether in the collections taken from 9 common habitats. These comprise 32 species all of which are listed, together with their distribution. The 5 most important species in each environment are given with their relative abundance in percentages of the total number collected in each habitat.

Melanoplus mexicanus ranked seventh in numbers for 1935, whereas in 1934 it ranked third. Encontolophus costalis has supplanted M. bivittatus in second place. M. femur-rubrum at fourth place and Aeneotettix deorum at fifth place have displaced M. packardii and Dissosteira carolina, respectively. The whole grasshopper population has been greatly reduced by vigorous, well-organized control campaigns during the past several years. In 1934 there were 30 counties needing some control measures. The survey in 1935 showed only 2 counties needing poisoned bait.

Distribution by species of 3,896 specimens collected in Minnesota, expressed in percentage of total number collected in each habitat.

Species	Small grains	Legumes	Road side	Pasture grass land	Rail-road	River-bottom	Pasture coulee patches	Irrigation ditch	Total specimens	Percentage of grand total
<i>Ageneotettix deorum</i> Scudd.	0.59	10.06	5.81	9.94	29.89	11.56	10.03	1.68	287	7.37
<i>Aeoloplus turnbullii</i> Thos.	--	--	--	.18	--	--	--	--	2	.05
<i>Arphia pseudonietana</i> Thos.	--	.30	.64	2.95	--	2.04	2.84	--	49	1.26
<i>Aulocara elliotti</i> Thos.	--	--	--	--	--	1.36	--	--	2	.05
<i>Cammula pellucida</i> Scudd.	27.25	20.73	24.14	18.46	7.75	9.52	25.57	42.86	835	21.43
<i>Chloealtis conspersa</i> Harr.	--	--	.09	.18	--	--	--	--	2	.05
<i>Chorthippus curtipennis</i> Harr.	4.31	2.74	7.26	2.95	5.75	1.36	.57	.84	163	4.18
<i>Dissosteira carolina</i> L.	.59	2.13	11.80	.18	8.05	.68	1.14	5.04	160	4.11
<i>Encoptolopus costalis</i> Scudd.	7.45	7.32	18.60	14.15	--	8.16	23.86	15.97	514	13.19
<i>Gomphocerus clavatus</i> Thom.	.20	--	.09	.81	--	1.36	--	--	14	.36
<i>Hadrotettix trifasciatus</i> Say	--	--	--	--	--	.68	--	--	1	.03
<i>Hesperotettix brevipennis</i> Thos.	--	--	.09	--	--	.68	--	.78	4	.10
<i>Hesperotettix viridis</i> Thos.	.20	--	.09	.54	--	--	--	--	8	.21
<i>Melanoplus angustipennis</i> Dodge	1.76	.61	.27	.18	--	--	--	--	16	.40
<i>Melanoplus bivittatus</i> Say	29.43	3.66	9.89	3.67	5.75	2.72	2.84	2.52	495	12.71
<i>Melanoplus bowditchi</i> Scudd.	--	.30	--	--	--	--	--	--	1	.03
<i>Melanoplus confusus</i> Scudd.	--	--	--	.18	--	--	--	--	2	.05
<i>Melanoplus dawsoni</i> Scudd.	9.22	7.62	4.97	8.77	1.15	1.36	1.14	13.45	265	6.80
<i>Melanoplus femur-rubrum</i> DeG.	5.88	28.35	8.80	3.94	5.75	8.16	18.18	5.04	333	8.55
<i>Melanoplus gladstoni</i> Scudd.	1.76	3.05	.27	6.18	--	11.56	3.41	.84	119	3.05
<i>Melanoplus infantilis</i> Scudd.	.20	--	--	.54	--	2.04	3.41	--	16	.42
<i>Melanoplus keeleri</i> luridus Dodge	1.18	2.44	1.45	.54	--	--	--	5.04	42	1.08
<i>Melanoplus mexicanus</i> Sauss.	5.29	7.32	2.36	7.52	35.63	3.40	1.70	3.36	214	5.49
<i>Melanoplus packardii</i> Scudd.	1.57	--	.54	.45	--	.68	--	.84	21	.54
<i>Mestobregma kiowa</i> Thos.	1.96	1.52	.45	6.98	1.14	30.61	2.84	.84	155	3.98
<i>Opeia obscura</i> Thos.	--	--	.09	--	--	--	--	--	1	.03
<i>Orphulella pelidna</i> Burm.	.59	--	--	.36	--	--	--	--	7	.18
<i>Orphulella speciosa</i> Scudd.	.78	.61	1.18	8.77	1.15	1.36	1.79	1.68	126	3.23
<i>Phoetaliotes nebrascensis</i> Thos.	--	.30	.18	.72	--	--	--	--	11	.29
<i>Spharagemon collaris</i> Scudd.	.78	.91	.73	.98	--	.68	.57	--	27	.69
<i>Stethophyma gracile</i> Thos.	--	--	.09	.18	--	--	--	--	3	.08
<i>Trimerotropis campestris</i> McNeill	--	--	.09	--	--	--	--	--	1	.03
Total specimens per environment	510	328	1,102	1,117	87	147	176	119	257	--



Minnesota

Small grains

Percent

1. Melanoplus bivittatus-----	28
2. Cammula pellucida-----	27
3. Melanoplus dawsoni-----	9
4. Encoptolophus costalis-----	7
5. Melanoplus femur-rubrum-----	6
6. Fifteen other species-----	23

Roadside

1. Cammula pellucida-----	24
2. Encoptolophus costalis-----	19
3. Dissostiera carolina-----	12
4. Melanoplus bivittatus-----	10
5. Melanoplus femur-rubrum-----	9
6. Twenty other species-----	26

Railroad

1. Melanoplus mexicanus-----	36
2. Ageneotettix deorum-----	30
3. Dissostiera carolina-----	8
4. Cammula pellucida-----	8
5. M. femur-rubrum-----	6
6. Five other species-----	12

Coulee

1. Cammula pellucida-----	26
2. Encoptolophus costalis-----	24
3. Melanoplus femur-rubrum-----	18
4. Ageneotettix deorum-----	10
5. M. gladstoni-----	3
6. Ten other species-----	19

Ditch bank

1. Melanoplus bivittatus-----	66
2. Cammula pellucida-----	14
3. Encoptolophus costalis-----	6
4. M. femur-rubrum-----	5
5. M. mexicanus-----	3
6. Five other species-----	6

Legumes

Percent

1. Melanoplus femur-rubrum-----	28
2. Cammula pellucida-----	21
3. Ageneotettix deorum-----	10
4. Melanoplus dawsoni-----	8
5. Encoptolophus costalis-----	7
6. Thirteen other species-----	26

Pasture

1. Cammula pellucida-----	18
2. Encoptolophus costalis-----	14
3. A. deorum-----	10
4. Melanoplus dawsoni-----	9
5. Orphulella speciosa-----	9
6. Twenty-one other species----	40

River bottom

1. Mestobregma kiowa-----	31
2. Ageneotettix deorum-----	11
3. Melanoplus gladstoni-----	12
4. C. pellucida-----	9
5. Encoptolophus costalis-----	8
6. Fifteen other species-----	29

Weed patch

1. Cammula pellucida-----	43
2. Encoptolophus costalis-----	16
3. Melanoplus dawsoni-----	13
4. Dissostiera carolina-----	5
5. Melanoplus femur-rubrum-----	5
6. Nine other species-----	18

Percentage of grand total

1. Cammula pellucida-----	21
2. Encoptolophus costalis-----	13
3. Melanoplus bivittatus-----	13
4. Melanoplus femur-rubrum-----	9
5. Ageneotettix deorum-----	7
6. Twenty-seven other species---	37

MONTANA

All of the collections in this State were made in that portion east of the Continental Divide. It is in the short-grass area which is subdivided for the State as follows:

1. Grama and western needlegrass:

Part of extreme east-central and extreme northeastern portions.

2. Western wheatgrass and sagebrush:

Large area extending diagonally from northwest to southeast through eastern half.

3. Grama grass:

General eastern two-thirds of State.

4. Grama grass and mountain sage:

Along eastern front of the mountains. The chief crops are small grains and alfalfa and there are large tracts of grazing lands that have been severely damaged during the last outbreak.

There were 10,401 specimens in the Montana collections, representing 42 species in 10 habitats. The distribution is given for all environments and the 5 most important species are listed for each habitat. Melanoplus mexicanus is still the dominant species in most places. In 1934 it was also the dominant species on the rangeland forming from 7 to 45 percent of the population. In 1935 M. mexicanus was fifth in abundance at 9 percent of the population. Cordillacris crenulata Brun, Mestobregma kiowa, and Ageneotettix deorum were the dominant species this past season.

Infestations have shifted from the northern counties to the Yellowstone Valley, where the worst outbreaks occurred last summer. For 10 years--1923 to 1934--this valley had been practically free from grasshopper trouble.

Distribution by species, of 10,401 specimens collected in Montana, expressed in percentage of total number collected in each habitat.

Species	Mixed road- side and small grain	Small grains	Soddy road- side	Weedy road- side	Plains grass- land	Legumes	Low moun- tain grass- land	Re- ver- sion	River bottom	Coulee	Total speci- mens	Percent- age of grand total
<i>Aeoloplus turnbullii</i> Thos.	0.10	--	--	0.61	0.08	--	--	0.21	0.15	--	13	0.12
<i>Aerochoreutes carlinianus</i> Thos.	.52	0.86	--	.10	--	--	--	--	--	--	22	.21
<i>Ageneotettix deorum</i> Scudd.	7.78	1.15	12.68	2.93	11.84	0.21	3.57	11.94	7.50	17.86	760	7.31
<i>Amphitornus bicolor</i> Thos.	.45	.43	9.77	1.72	5.43	--	3.57	7.68	5.36	--	386	3.71
<i>Arphia pseudonietana</i> Thos.	.07	--	--	--	.71	--	--	--	.31	--	22	.21
<i>Aulocara elliotti</i> Thos.	2.71	2.15	14.58	6.96	10.10	.14	15.48	15.78	7.94	7.14	653	6.28
<i>Boopedon nubilum</i> Say	.03	--	--	--	--	--	--	--	.46	--	4	.04
<i>Bruneria brunnea</i> Thos.	.35	--	--	--	1.27	--	--	--	--	--	42	.40
<i>Camula pellucida</i> Scudd.	.97	2.01	2.77	4.54	1.47	5.00	--	.21	11.49	--	289	2.78
<i>Chorthippus curtipennis</i> Harr.	--	--	--	.10	--	1.79	--	--	--	--	26	.25
<i>Cordillacris crenulata</i> Brun.	.03	--	7.00	.30	14.59	--	--	--	.31	--	421	4.05
<i>Derotmema haydenii</i> Thos.	.10	--	.29	.10	--	--	--	--	--	--	7	.07
<i>Dissosteira carolina</i> L.	2.57	1.00	--	.10	.08	.29	--	--	.62	--	92	.83
<i>Drepanopterna femoratum</i> Scudd.	1.91	.57	2.62	1.72	3.26	--	--	2.56	29.25	17.86	382	3.67
<i>Encoptolophus costalis</i> Scudd.	1.39	--	--	--	1.39	--	--	--	.62	--	79	.76
<i>Gomphocerus clavatus</i> Thom.	.07	--	--	.30	.24	--	--	--	.46	--	14	.13
<i>Hadrotettix trifasciatus</i> Say	.29	.14	.44	--	.08	--	--	--	.31	--	16	.15
<i>Hesperotettix viridis</i> Thos.	.03	--	.44	--	.12	--	--	1.07	1.07	--	19	.18
<i>Hyochlora alba</i> Dodge	.03	--	--	--	--	--	--	--	--	--	1	.01
<i>Melanoplus angustiviridis</i> Dodge	.24	--	--	--	--	--	--	10.23	--	--	55	.53
<i>Melanoplus bivittatus</i> Say	1.81	1.72	--	1.72	.04	6.55	--	.21	.62	--	173	1.66
<i>Melanoplus bowditchi</i> Scudd.	--	--	--	--	--	--	--	--	.46	17.86	8	.08
<i>Melanoplus confusus</i> Scudd.	--	--	--	.10	.32	--	--	--	2.14	--	23	.22
<i>Melanoplus davsoni</i> Scudd.	--	.14	--	--	.08	2.07	1.19	--	.15	--	34	.33
<i>Melanoplus femur-rubrum</i> DeG.	4.79	6.31	--	27.55	.79	36.10	10.71	.85	.77	--	998	9.60
<i>Melanoplus gladstoni</i> Scudd.	1.25	--	--	--	.32	--	2.38	1.14	--	--	48	.46
<i>Melanoplus infestilis</i> Scudd.	2.08	1.72	5.25	.91	6.32	.29	44.05	4.92	--	--	355	3.41
<i>Melanoplus mexicanus</i> Sauss.	57.12	73.17	19.68	38.85	8.59	44.46	13.10	24.52	10.57	39.29	3718	35.75
<i>Melanoplus occidentalis</i> Thos.	--	--	.87	--	1.03	--	--	.21	--	7.14	35	.34
<i>Melanoplus packardii</i> Scudd.	17.45	7.03	1.90	4.54	.87	3.29	1.19	10.45	2.30	3.57	455	4.37



Montana (Cont'd).

Species	Mixed road- side and small grain	Small grains	Soddy road- side	Weedy Plains road- side	Low 40- grass- land	Re- ver- sion	River bottom	Coulee more	Total specimens	Percent- age of total
<i>Metobregma kiowa</i> Thos.	1.08	0.43	12.54	2.32	13.57	9.07	4.76	1.58	503	4.84
<i>Metator pardalinus</i> Sauss.	.94	--	2.62	1.31	2.11	--	--	.52	129	1.24
<i>Opeia obscura</i> Thos.	.76	.14	4.66	1.72	4.09	--	--	6.58	223	2.14
<i>Orphulella speciosa</i> Scudd.	.03	--	--	--	.60	--	--	2.14	30	.29
<i>Palibostroma quadrimaculatum</i> Thos.	1.53	--	1.60	.61	5.76	--	--	--	206	1.98
<i>Phoetaliotes nebrascensis</i> Thos.	.52	--	--	--	.36	.07	--	6.13	65	.62
<i>Schistocerca lineata</i> Scudd.	.07	--	--	--	--	--	--	--	2	.02
<i>Spharagemon collaris</i> Scudd.	.35	--	--	--	.44	.07	--	.15	27	.26
<i>Spharagemon eguale</i> Say	.49	.29	.29	.15	.76	--	--	.77	59	.57
<i>Trimerotropis crumpestris</i> McNeill	.39	.43	--	--	--	--	--	--	4	.04
<i>Trimerotropis pallidipennis</i> Burm.	--	.29	--	--	--	--	--	--	2	.02
<i>Trimerotropis sparsa</i> Thos.	.03	--	--	--	--	--	--	--	1	.01
Total specimens per environment--	2876	697	686	991	2516	1399	84	469	553	28

Montana

Small grains and roadside

	<u>Percent</u>
1. Melanoplus mexicanus-----	57
2. Melanoplus packardii-----	17
3. Ageneotettix deorum-----	8
4. Melanoplus femur-rubrum-----	5
5. Aulocara ellioti-----	3
6. Thirty-one other species-----	10

Soddy roadside

1. Melanoplus mexicanus-----	20
2. Aulocara ellioti-----	15
3. Ageneotettix deorum-----	13
4. Mestobregma kiowa-----	12
5. Amphitornus coloradus-----	10
6. Thirteen other species-----	30

Plains grassland

1. Cordillacris crenulata-----	15
2. Mestobregma kiowa-----	14
3. Ageneotettix deorum-----	12
4. Aulocara ellioti-----	10
5. Melanoplus mexicanus-----	9
6. Twenty-six other species-----	40

Low mountain grassland

1. Melanoplus infantilis-----	44
2. Aulocara ellioti-----	15
3. Melanoplus mexicanus-----	13
4. Melanoplus femur-rubrum-----	11
5. Mestobregma kiowa-----	5
6. Five other species-----	12

River bottom

1. Drepanopterna femoratum-----	29
2. Melanoplus mexicanus-----	11
3. Cammula pellucida-----	11
4. Ageneotettix deorum-----	8
5. Aulocara ellioti-----	7
6. Twenty-three other species-----	34

Small grains

	<u>Percent</u>
1. Melanoplus mexicanus-----	73
2. Melanoplus packardii-----	7
3. Melanoplus femur-rubrum-----	6
4. Aulocara ellioti-----	2
5. Cammula pellucida-----	2
6. Fourteen other species-----	10

Weedy roadside

1. Melanoplus mexicanus-----	39
2. Melanoplus femur-rubrum-----	28
3. Aulocara ellioti-----	7
4. Cammula pellucida-----	4
5. Melanoplus packardii-----	4
6. Eighteen other species-----	18

Legumes

1. Melanoplus mexicanus-----	44
2. Melanoplus femur-rubrum-----	36
3. Melanoplus bivittatus-----	6
4. Cammula pellucida-----	5
5. Melanoplus packardii-----	3
6. Nine other species-----	6

Reversion

1. Melanoplus mexicanus-----	25
2. Aulocara ellioti-----	16
3. Ageneotettix deorum-----	12
4. Melanoplus packardii-----	10
5. Melanoplus angustipennis-----	10
6. Fifteen other species-----	27

Coulee

1. Melanoplus mexicanus-----	39
2. Melanoplus bowditchi-----	18
3. Drepanopterna femoratum-----	18
4. Ageneotettix deorum-----	18
5. Aulocara ellioti-----	7
6. None	

Percentage of grand total

1. Melanoplus mexicanus-----	36
2. Melanoplus femur-rubrum-----	10
3. Ageneotettix deorum-----	7
4. Aulocara ellioti-----	6
5. Mestobregma kiowa-----	5
6. Other species-----	36

## NEBRASKA

The collections made in Nebraska were divided into two lots:

(1) Those taken in the extreme eastern part and (2) those in the middle and western parts. Nebraska is comprised of the following natural vegetation areas:

1. Tall-grass prairie in eastern portion:

(a) Bluestem sod association in the extreme east.

(b) Needlegrass and slender wheatgrass association just west of (a).

2. Sand sage-sand grass area in the middle of the State. Here the soil is far too light for safe cultivation and very few collections were made.

3. Wiregrass association containing an open cover of grama grass, Buffalo grass and wiregrass.

4. Grama-buffalo grass association in the extreme west.

In all parts of the State there are the common weeds Ambrosia, Chenopodium, Amaranthus, Lactuca, Polygonum, Salsola, Leptilon, Grindelia.

Twelve species were collected in the tall-grass area and 33 in the short-grass area. Most of the collections in the eastern part were made along roadsides, in legumes, and in rape. There were 844 specimens collected in three habitats with Melanoplus mexicanus by far the most important species. In the western part most of the collections were made along roadsides and in legumes, and 958 specimens were taken from six habitats. M. flammul-rubrum was the dominant species in a total of all collections. This was due, perhaps, to the fact that most of the specimens came from roadsides and alfalfa fields. The six most important species and their relative abundance are listed for each habitat.

The worst infestations in 1935 were limited to the eastern counties bordering the Missouri River. Here the general population has increased over 1934. In the western part, where farming is somewhat spotted, infestations were light and spotted in 1935.



number collected in each habitat.

Species	Small grains	Road-side	Legumes	Plains grassland	Railroad	Corn	Total specimens	Percentage of grand total
Aeoloplus turnbullii Thos.	--	6.16	--	--	--	--	21	2.19
Ageneotettix deorum Scudd.	--	2.35	5.13	27.47	10.28	11.34	69	7.20
Aulocara elliotti Thos.	12.50	--	1.83	--	7.48	--	19	1.98
Boopedon nubilum Say	--	--	--	1.10	--	--	1	.10
Brachystola magna Gir.	2.08	--	--	1.10	--	--	2	.21
Camula pellucida Scudd.	--	.29	--	--	--	--	1	.10
Derotmena haydenii Thos.	2.08	--	.37	--	--	--	2	.21
Dissosteira carolina L.	8.33	.29	1.10	--	--	--	19	1.98
Drepanopterna femoratum Scudd.	12.50	.88	1.10	1.10	1.87	8.25	13	1.36
Hadrotettix trifasciatus Say	10.42	1.47	.73	--	.93	--	13	1.36
Hesperotettix speciosus Scudd.	--	.59	--	--	--	--	2	.21
Hesperotettix viridis Thos.	--	--	--	--	--	1.03	1	.10
Hippiscus rugosus Scudd.	--	.59	--	--	--	--	2	.21
Melanoplus angustipennis Dodge	--	--	8.42	--	--	--	56	5.85
Melanoplus bivittatus Say	--	7.92	9.16	2.20	3.74	29.90	68	7.10
Melanoplus dawsoni Scudd.	--	--	.37	--	--	5.15	1	.10
Melanoplus differentialis Thos.	6.25	5.87	4.76	--	2.80	1.03	40	5.18
Melanoplus femur-rubrum Deg.	2.08	49.56	30.40	--	48.60	3.09	308	32.15
Melanoplus gladstoni Scudd.	--	--	1.10	3.30	--	--	6	.63
Melanoplus infantilis Scudd.	--	--	.73	--	--	1.03	3	.31
Melanoplus lakinus Scudd.	--	3.81	.37	--	--	--	14	1.46
Melanoplus mexicanus Sauss.	16.67	10.26	26.37	15.38	13.08	30.93	173	18.06
Melanoplus occidentalis Thos.	2.08	--	--	--	--	--	1	.10
Melanoplus packardii Scudd.	4.17	3.23	2.56	7.69	--	7.22	34	3.55
Mermiria maculipennis Rehn	2.08	1.76	--	1.10	.93	--	9	.94
Nestobregma kiowa Thos.	--	1.17	2.56	1.10	--	1.03	13	1.36
Metator pardalinus Sauss.	14.58	.29	.37	--	--	--	9	.94
Opeia obscura Thos.	--	.29	--	2.20	--	--	3	.31
Phlibostroma quadrimaculatum Thos.	--	.29	.73	21.98	--	--	23	2.40
Phoetaliotes nebrascensis Thos.	--	2.05	--	--	.93	--	8	.84
Spharagemon collaris Scudd.	--	.29	.37	--	--	--	2	.21
Spharagemon equale Say	4.17	.29	1.47	14.29	.93	--	21	2.19
Trimerotropis agrestis McNeill	--	.29	--	--	--	--	1	.10
Total specimens per environment	48	341	273	91	107	97	--	--

Distribution by species of 844 specimens collected in Eastern Nebraska, expressed in percentage of total number collected in each habitat (Cont'd.)

Species	Small grains	Road-side	Legumes	Rape	Rail-road	Corn	Total specimens	Percentage of grand total
Ageneotettix deorum Scudd.	--	4.10	0.00	---	--	--	18	2.13
Derotmema haydeni Thos.	--	.24	--	--	--	--	1	.12
Dissosteira Carolina L.	--	.24	--	0.70	--	--	3	.36
Encoptolophus costalis Scudd.	--	.48	.37	---	--	--	3	.36
Melanoplus bivittatus Say	--	2.65	1.49	.70	--	--	16	1.90
Melanoplus differentialis Thos.	--	3.86	2.61	.70	--	--	24	2.84
Melanoplus femur-rubrum DeG.	--	29.16	4.10	3.50	--	--	138	16.35
Melanoplus mexicanus Sauss.	--	56.87	91.42	94.41	--	--	620	73.46
Mestobregma kiowa Thos.	0.72	---	--	---	--	--	3	.36
Metator pardalinus Sauss.	--	.72	--	---	--	--	3	.36
Opeia obscura Thos.	--	.24	--	---	--	--	1	.12
Phlibostroma quadrimaculatum Thos.	--	.72	--	---	--	--	3	.36
Total specimens per environment--	415.0	268.0	143.0	---	--	--	--	--

Nebraska

Eastern part

Roadside

Percent

1.	Melanoplus mexicanus-----	57
2.	Melanoplus femur-rubrum----	29
3.	Ageneotettix deorum-----	4
4.	Melanoplus differentialis--	4
5.	Melanoplus bivittatus-----	3
6.	Seven other species-----	3

Legumes

1.	Melanoplus mexicanus-----	91
2.	Melanoplus femur-rubrum----	4
3.	Melanoplus differentialis--	2
4.	Melanoplus bivittatus-----	2
5.	Encyrtolophus costalis-----	1
6.	No others	

Roadside

1.	Melanoplus femur-rubrum----	50
2.	Melanoplus mexicanus-----	10
3.	Melanoplus bivittatus-----	8
4.	Aeoloplus turnbullii-----	6
5.	Melanoplus differentialis--	6
6.	Eighteen other species-----	20

Legumes

1.	Melanoplus femur-rubrum----	30
2.	Melanoplus mexicanus-----	26
3.	Melanoplus bivittatus-----	9
4.	Melanoplus angustipennis--	8
5.	Ageneotettix deorum-----	5
6.	Sixteen other species-----	22

Small grains

1.	Melanoplus mexicanus-----	17
2.	Metator pardalinus-----	15
3.	Aulocara ellioti-----	12
4.	Drepanopterna femoratum----	12
5.	Hadrotettix trifasciatus--	10
6.	Nine other species-----	34

Plains grassland

1.	Ageneotettix deorum-----	27
2.	Philibostroma quadrimacula-	
	tum-----	22
3.	Melanoplus mexicanus-----	15
4.	Spharogemon equale-----	14
5.	Melanoplus packardii-----	8
6.	Eight other species-----	14

Rape

Percent

1.	Melanoplus mexicanus-----	94
2.	Melanoplus femur-rubrum----	3
3.	Melanoplus bivittatus-----	1
4.	Melanoplus differentialis--	1
5.	Dissosteira carolina-----	1
6.	No others	

Percentage of grand total

1.	Melanoplus mexicanus-----	73
2.	Melanoplus femur-rubrum----	16
3.	Melanoplus bivittatus-----	3
4.	Ageneotettix deorum-----	2
5.	Melanoplus bivittatus-----	2
6.	Seven other species-----	4

Western part

Railroad

1.	Melanoplus femur-rubrum----	49
2.	Melanoplus mexicanus-----	13
3.	Ageneotettix deorum-----	10
4.	Melanoplus bivittatus-----	8
5.	Aulocara ellioti-----	7
6.	Six other species-----	13

Corn

1.	Melanoplus mexicanus-----	31
2.	Melanoplus angustipennis----	30
3.	Ageneotettix deorum-----	11
4.	Dissosteira carolina-----	8
5.	Melanoplus packardii-----	7
6.	Six other species-----	13

Percentage of grand total

1.	Melanoplus femur-rubrum----	32
2.	Melanoplus mexicanus-----	18
3.	Ageneotettix deorum-----	7
4.	Melanoplus bivittatus-----	7
5.	Melanoplus angustipennis----	6
6.	Thirty-three other species---	30



NORTH DAKOTA

The collections made in North Dakota were divided into those taken from the eastern half, or tall-grass prairie, or those from the western half, or short-grass region. The natural vegetation is as follows:

1. Tall-grass area (eastern half):

- (a) Bluestem sod association--extreme eastern portion or along the Red River Valley.
- (b) Needlegrass-slender wheatgrass--west of (a) to just beyond Jamestown and swinging northwest to Canada.

2. Short-grass region (western half):

- (a) Grama and western needlegrass--most of the western half.
- (b) Western wheatgrass and sagebrush--badlands of southwestern quarter.
- (c) Grama grass--extreme west and southwest.

This is mostly the hard-spring-wheat area, with intensive farming in the east and large-scale crop production in the west. The east is more mesophytic and west xerophytic.

In the eastern half 673 specimens were collected, representing 22 species. In the west 5,447 specimens were taken, representing 41 species. Melanoplus mexicanus was the dominant species in both portions. In 1934 Camnula pellucida was right up to the top in abundance in the eastern part of the State, but in 1935 it fell to fourth place. It ran from 50 to 75 percent of the total grasshopper population in the eastern part in 1934, but in 1935 it was under 10 percent anywhere. June rains reduced the numbers of the particular species considerably.

The populations were low in the eastern quarter and in the southern tier of counties east of the Missouri River. In parts of the north-central, northwestern, and southwestern counties, severe infestations still occurred, but the general population since 1934 has been reduced about 50 percent over most of the State.

Species	Small grains	Flax	Road-side	Pasture	Railroad	Total specimens	Percentage of grand total
<i>Ageneotettix deorum</i> Scudd.	2.59	1.11	4.94	5.08	8.70	28	4.15
<i>Arphia pseudonietana</i> Thos.	.52	1.11	--	1.03	--	4	.59
<i>Cannula pellucida</i> Scudd.	1.04	1.11	11.11	9.14	6.52	42	6.23
<i>Chorthippus curtipennis</i> Harr.	1.55	--	1.23	3.55	--	14	2.08
<i>Dissosteira carolina</i> L.	.52	--	2.47	--	2.17	4	.59
<i>Encyrtolophus costalis</i> Scudd.	4.15	3.33	23.46	17.26	17.39	72	10.68
<i>Hesperotettix viridis</i> Thos.	.52	--	--	.51	2.17	7	1.04
<i>Melanoplus angustipennis</i> Dodge	2.59	--	--	--	--	5	.74
<i>Melanoplus bivittatus</i> Say	1.04	2.22	2.47	.51	--	7	1.04
<i>Melanoplus dawsoni</i> Scudd.	1.55	--	1.23	7.11	6.52	23	3.41
<i>Melanoplus differentialis</i> Thos.	--	--	--	.51	--	1	.15
<i>Melanoplus femur-rubrum</i> DeG.	10.88	14.44	2.47	11.17	8.70	74	10.98
<i>Melanoplus gladstoni</i> Scudd.	1.04	1.11	1.23	.51	--	4	.59
<i>Melanoplus infantilis</i> Scudd.	--	--	--	5.08	--	10	1.48
<i>Melanoplus mexicanus</i> Sauss.	67.36	70.00	39.51	28.43	45.65	323	47.92
<i>Melanoplus packardii</i> Scudd.	2.07	2.22	4.94	1.52	--	13	1.93
<i>Mermiria maculipennis</i> mcclungi Rehn.	--	1.11	--	--	--	1	.15
<i>Mestobregma kiowa</i> Thos.	1.04	--	--	6.09	2.17	14	2.08
<i>Opeia obscura</i> Thos.	--	1.11	--	--	--	1	.15
<i>Orpulella speciosa</i> Scudd.	--	--	--	.51	--	1	.15
<i>Phaetaliotes nebrascensis</i> Thos.	2.59	--	--	--	--	8	1.19
<i>Spharagemon collaris</i> Scudd.	--	1.11	4.94	--	--	17	2.52
Total specimens per environment	193	90	81	197	46	--	--

Eastern North Dakota

Small grains

Percent

1. Melanoplus mexicanus-----	67
2. Melanoplus femur-rubrum-----	11
3. Encoptolophus costalis-----	4
4. Ageneotettix deorum-----	3
5. Phoetaliotes nebrascensis---	3
6. Eleven others-----	12

Roadside

1. Melanoplus mexicanus-----	40
2. Encoptolophus costalis-----	23
3. Camnula pellucida-----	11
4. Ageneotettix deorum-----	5
5. Melanoplus packardii-----	5
6. Seven others-----	16

Railroad

1. Melanoplus mexicanus-----	46
2. Encoptolophus costalis-----	17
3. Melanoplus femur-rubrum-----	9
4. Ageneotettix deorum-----	9
5. Camnula pellucida-----	7
6. Four others-----	12

Flax

Percent

1. Melanoplus mexicanus-----	70
2. Melanoplus femur-rubrum-----	14
3. Encoptolophus costalis-----	3
4. Melanoplus bivittatus-----	2
5. Melanoplus packardii-----	2
6. Seven others-----	9

Pasture

1. Melanoplus mexicanus-----	28
2. Encoptolophus costalis-----	17
3. Melanoplus femur-rubrum-----	11
4. Camnula pellucida-----	9
5. Melanoplus dawsoni-----	7
6. Eleven others-----	28

Percentage of grand total

1. M. mexicanus-----	48
2. M. femur-rubrum-----	11
3. Encoptolophus costalis-----	11
4. Camnula pellucida-----	6
5. Ageneotettix deorum-----	4
6. Seventeen others-----	20



Distribution by species, of 5,447 specimens collected in western North Dakota, expressed in percentage of total number collected in each habitat

Species	Small grains	Crested wheat-grass	Upland prairie	Legumes	Flax	Road-side	Rail-road right of way	Bottom-land	Pasture	Total specimens	Percentage of grand total
<i>Aeoloplus turnbullii</i> Thos.	--	--	--	--	--	1.15	--	--	0.88	22	0.40
<i>Agneotettix deorum</i> Scudd.	15.49	8.40	33.18	0.73	6.85	11.75	31.91	8.91	28.75	912	16.74
<i>Amphitornus bicolor</i> Thos.	.19	--	3.56	--	1.47	.25	1.06	.50	1.26	42	.77
<i>Arphia pseudonietana</i> Thos.	.10	--	.22	--	--	--	.27	--	.38	6	.11
<i>Aulocara ellioti</i> Thos.	2.87	1.05	3.34	--	5.13	.32	.27	.99	1.13	95	1.74
<i>Camula pellucida</i> Scudd.	2.77	38.87	--	.36	.49	.82	.53	15.35	.63	267	4.90
<i>Chorthippus curtipennis</i> Harr.	.10	--	--	--	--	--	--	5.94	--	13	.24
<i>Cordiliacris crenulata</i> Brun.	--	--	--	--	--	--	--	--	.76	6	.11
<i>Dactyloctenium pictum</i> Thos.	--	--	--	--	--	--	--	--	.13	1	.02
<i>Derotmena haydenii</i> Thos.	.57	4.41	--	--	--	.08	.27	--	--	29	.53
<i>Dissosteira carolina</i> L.	5.93	2.31	.22	2.55	1.71	18.82	5.59	2.48	.25	364	6.68
<i>Drepanopterna femoratum</i> Scudd.	.19	--	4.45	--	4.16	.66	1.06	1.98	4.41	90	1.65
<i>Encoptolophus costalis</i> Scudd.	1.24	.63	.45	--	.98	.49	.27	14.36	1.89	74	1.36
<i>Gomphoceris clavatus</i> Thom.	--	--	--	--	--	--	--	--	1.13	1	.02
<i>Hadrotettix trifasciatus</i> Say	.10	--	.45	--	--	.41	.53	--	--	10	.18
<i>Hesperotettix speciosus</i> Scudd.	--	--	--	--	--	--	--	--	1.13	1	.02
<i>Hesperotettix viridis</i> Thos.	.29	--	.67	--	.24	.49	--	--	.13	15	.28
<i>Hypochlora alba</i> Dodge	--	--	--	--	--	--	--	--	.13	1	.02
<i>Melanoplus angustipennis</i> Dodge	1.72	.21	--	2.55	4.16	3.29	2.13	--	1.13	112	2.06
<i>Melanoplus bivittatus</i> Say	.57	--	--	.36	1.71	1.07	--	--	--	37	.68
<i>Melanoplus bowditchi</i> Scudd.	--	--	--	--	--	--	.27	--	--	1	.02
<i>Melanoplus dawsoni</i> Scudd.	.19	--	--	.36	--	--	--	--	--	3	.06
<i>Melanoplus differentialis</i> Thos.	1.05	--	--	.36	1.71	.41	--	--	--	38	.70
<i>Melanoplus femur-rubrum</i> DeG.	4.11	.84	.67	10.91	12.47	2.96	1.86	1.98	.13	183	3.36
<i>Melanoplus gladstoni</i> Scudd.	.86	1.05	4.68	3.27	1.47	1.89	1.60	.99	2.65	104	1.91
<i>Melanoplus infentilis</i> Scudd.	1.24	3.78	3.12	1.09	.73	.82	1.33	--	4.79	104	1.91
<i>Melanoplus mexicanus</i> Sauss.	45.89	26.68	9.35	59.27	34.47	31.06	19.41	12.38	8.58	1586	29.12
<i>Melanoplus packardii</i> Scudd.	.69	1.89	2.23	14.91	4.88	6.41	4.26	.50	.50	265	4.87

Western North Dakota (Cont'd).

Species	Small grains	Crested wheat-grass	Upland prairie	Legumes	Flax	Road-side	Rail-road right of way	Bottom-land	Pasture	Total specimens	Percentage of grand total
<i>Mermiria maculipennis meclurgii</i> Rehn	--	--	--	--	--	--	8.24	--	--	31	0.57
<i>Mestobregma kiowa</i> Thos.	1.55	1.47	2.45	--	2.69	3.20	7.18	2.97	12.74	220	4.04
<i>Metator pardalinus</i> Sauss.	.86	6.73	1.56	0.36	7.58	4.03	1.86	14.85	7.19	223	4.09
<i>Opeia obscura</i> Thos.	1.63	--	2.45	.73	3.19	.53	3.19	6.44	1.89	95	1.71
<i>Ornulella speciosa</i> Scudd.	.10	--	--	--	--	--	.27	1.98	--	6	.11
<i>Philibostroma quadrimaculatum</i> Thos.	.57	--	26.28	1.09	--	6.16	3.72	3.96	16.77	358	6.57
<i>Phoetaliotes nebrascensis</i> Thos.	1.53	--	--	.36	2.20	1.40	1.33	1.49	1.51	68	1.25
<i>Spharagemon bollii</i> Scudd.	.19	--	--	--	.24	--	--	--	--	3	.06
<i>Spharagemon collaris</i> Scudd.	.96	.84	--	.73	.24	.49	1.05	1.98	.13	34	.62
<i>Spharagemon coule</i> Say	.29	.63	.67	--	.24	.49	.53	--	.13	20	.37
<i>Trimerotropis campestris</i> McNeill	--	.21	--	--	--	--	--	--	--	1	.02
<i>Trimerotropis laticincta</i> Sauss.	.10	--	--	--	--	--	--	--	--	1	.02
<i>Trimerotropis pallidipennis</i> Burn.	--	--	--	--	--	--	--	--	.13	1	.02
Total specimens per environment	1046	476	449	275	409	1217	376	202	793		

Western North Dakota

Small grains

Percent

1. Melanoplus mexicanus-----	46
2. Ageneotettix deorum-----	15
3. Melanoplus packardii-----	7
4. Dissosteira carolina-----	6
5. Melanoplus femur-rubrum-----	4
6. Twenty-six others-----	22

Upland prairie

1. Ageneotettix deorum-----	33
2. Phlibostroma quadrimaculatum--	26
3. Melanoplus mexicanus-----	9
4. Melanoplus gladstoni-----	5
5. Drepanopterna feneratorum-----	4
6. Fourteen others-----	23

Flax

1. Melanoplus mexicanus-----	34
2. Melanoplus femur-rubrum-----	12
3. Metator pardalinus-----	8
4. Ageneotettix deorum-----	7
5. Aulocara ellioti-----	5
6. Eighteen others-----	34

Railroad

1. Ageneotettix deorum-----	32
2. Melanoplus mexicanus-----	19
3. Mermiria maculipennis-----	8
4. Mestobregma kiowa-----	7
5. Dissosteira carolina-----	6
6. Twenty-one others-----	28

Pasture

1. Ageneotettix deorum-----	29
2. Phlibostroma quadrimaculatum--	17
3. Mestobregma kiowa-----	13
4. Melanoplus mexicanus-----	9
5. Metator pardalinus-----	7
6. Twenty-four others-----	25

Crested wheat grass

Percent

1. Cammula pellucida-----	39
2. Melanoplus mexicanus-----	27
3. Ageneotettix deorum-----	8
4. Metator pardalinus-----	7
5. Derotrera haydenii-----	4
6. Twelve others-----	15

Legumes

1. Melanoplus mexicanus-----	59
2. Melanoplus packardii-----	15
3. Melanoplus femur-rubrum-----	11
4. Melanoplus gladstoni-----	3
5. Dissosteira carolina-----	3
6. Twelve others-----	9

Roadside

1. Melanoplus mexicanus-----	31
2. Dissosteira carolina-----	19
3. Ageneotettix deorum-----	12
4. Melanoplus packardii-----	6
5. Phlibostroma quadrimaculatum--	6
6. Twenty-one others-----	26

Bottomland

1. Cammula pellucida-----	15
2. Metator pardalinus-----	15
3. Encoptolophus costalis-----	14
4. Melanoplus mexicanus-----	12
5. Ageneotettix deorum-----	9
6. Fourteen others-----	35

Percentage of grand total

1. Melanoplus mexicanus-----	29
2. Ageneotettix deorum-----	17
3. Dissosteira carolina-----	7
4. Phlibostroma quadrimaculatum--	5
5. Cammula pellucida-----	5
6. Thirty-seven others-----	35



SOUTH DAKOTA

All of the collections in South Dakota were made in the short-grass region. There are five types of association occurring in this area:

1. Grama and western needlegrass:  
East of the Missouri and north of the Moreau Rivers.
2. Western wheatgrass:  
Most of the area south of the Moreau River and west of the Missouri River.
3. Grama-buffalo grass:  
A strip east and west south of the White River and west of the Missouri River.
4. Western wheatgrass and sagebrush:  
Extreme northwestern portion in foothills.
5. Grama grass:  
Also extreme northwestern portion on plains.

Most of the collecting was restricted to places other than cultivated crops. There were no collections in corn and only a small percentage (3 percent) in small grains. The bulk of the specimens came from the native grasslands; therefore, any statements regarding relative abundance of the different species must be modified by this fact.

A total of 2,741 specimens were taken, representing 47 species. The dominant species in the whole lot were Ageneotettix deorum and Mestobregma kiowa, each equaling about 19 percent of the total number collected. Melanoplus mexicanus ranks third, at approximately 13 percent.

M. bivittatus and M. differentialis were still not very abundant after the drought, which decimated their numbers; however, observation showed that these two species are building up again in the cultivated crops along river courses.

In 1934 M. mexicanus was the dominant species in this part of South Dakota, but this year it has fallen to third place. Strange to say, Mestobregma kiowa was the most numerous of all species in alfalfa, constituting 42 percent. These collections were made in September when the alfalfa was short and dry. In 1934 M. mexicanus constituted from 40 to 80 percent of the populations in alfalfa in this area, but in 1935, only 7 percent.

Threatening infestations were found all along the river courses in the central and western parts of the State. The worst infestations were along the Missouri River bottom in Hughes County.

Distribution by species of 2,741 specimens collected in western South Dakota, expressed in percentage of total number collected in each habitat

Species	Small grains	Road side	Plains grass-land	Legumes	Pasture grass-land	Low-mountain grass-land	Weedy patches	River bot-tom	Railroad right of way	Total specimens	Percentage of grand total
<i>Aeoloplus turnbullii</i> Thos.	--	5.63	--	0.56	0.79	--	3.98	7.93	--	59	2.15
<i>Ageneotettix deorum</i> Scudd.	4.82	8.23	24.89	19.44	25.59	21.90	6.25	14.10	25.87	534	19.48
<i>Amphitornus bicolor</i> Thos.	--	.87	7.27	2.78	.39	4.44	1.14	2.64	.60	101	3.68
<i>Arphis pseudonietana</i> Thos.	--	.43	.11	--	--	--	--	--	--	2	.07
<i>Aulocara elliotti</i> Thos.	--	.43	2.27	.56	1.57	14.92	11.93	5.95	--	121	4.41
<i>Boopedon nubilum</i> Say	--	.43	.11	--	--	--	3.98	--	--	9	.33
<i>Brachystola magna</i> Gir.	--	.43	--	--	--	--	--	--	--	1	.04
<i>Camula pellucida</i> Scudd.	4.82	5.63	--	1.67	2.76	1.90	--	--	--	33	1.20
<i>Chorthippus curtipennis</i> Harr.	2.41	1.30	--	--	--	--	--	--	--	5	.18
<i>Cordillacris crenulata</i> Brun.	--	--	1.14	1.11	--	--	--	--	--	12	.44
<i>Cordillacris occipitalis</i>	--	--	.11	1.11	.39	7.62	.57	2.64	--	41	1.50
<i>Derotoma haydonii</i> Thos.	--	7.36	.23	--	.39	--	5.11	.44	.60	32	1.17
<i>Dissosteira carolina</i> L.	26.51	5.63	.45	2.78	--	--	9.09	1.32	--	66	2.41
<i>Dissosteira longipennis</i> Thos.	--	--	--	--	--	--	1.14	--	--	1	.04
<i>Drepanopterna femoratum</i> Scudd.	1.20	--	1.82	5.00	--	2.76	12.50	11.01	--	105	3.83
<i>Encoptolopus costalis</i> Scudd.	--	--	--	.56	3.94	--	--	1.54	--	18	.66
<i>Gomphoceris clavatus</i> Thom.	--	--	--	.56	--	2.54	--	.22	--	10	.36
<i>Hadrotettix trifasciatus</i> Say	--	2.60	.57	.56	1.57	--	6.82	5.51	--	53	1.93
<i>Hesperotettix viridis</i> Thos.	--	1.30	.11	.56	--	2.22	--	.44	1.79	17	.62
<i>Hippiscus rugosus</i> Scudd.	--	--	--	--	--	--	--	.44	--	2	.07
<i>Melanoplus angustipennis</i> Dodge	--	.43	--	--	--	9.21	--	--	1.19	32	1.17
<i>Melanoplus bivittatus</i> Say	--	.43	--	.56	--	1.59	3.41	.22	--	14	.51
<i>Melanoplus confusus</i> Scudd.	--	2.16	--	--	--	1.27	--	--	--	9	.33
<i>Melanoplus dawsoni</i> Scudd.	--	.43	--	--	--	--	--	--	--	1	.04
<i>Melanoplus differentialis</i> Thos.	--	.43	--	--	.39	--	2.27	--	--	6	.22
<i>Melanoplus femur-rubrum</i> DeG.	4.82	6.49	1.02	5.56	.79	--	--	.22	3.57	47	1.71
<i>Melanoplus gladstoni</i> Scudd.	--	--	2.50	--	.79	--	--	--	1.79	27	.99
<i>Melanoplus infantilis</i> Scudd.	--	--	.45	--	--	--	--	--	--	4	.15

Western South Dakota (Cont'd.)

Species	Small grains	Road side	Plains grass-land	Legumes	Pasture: grass land	Mountain grassland	Weedy patches	River: Railroad bot- tom	Right of way	Total specimens	Percentage of grand total
Melanoplus lakinus Scudd.	--	--	--	1.11	--	--	0.57	7.93	--	39	1.42
Melanoplus mexicanus Sauss.	51.81	25.97	7.84	6.67	14.57	3.81	16.48	3.30	42.86	349	12.73
Melanoplus occidentalis Thos.	--	--	.68	--	--	--	1.14	--	--	8	.29
Melanoplus packardii Scudd.	--	4.33	2.05	--	.79	.63	--	2.86	5.95	55	2.01
Mermiria maculipennis Rehn.	--	6.93	.11	--	--	--	--	6.17	--	45	1.64
Mestobregma kiowa Thos.	--	9.09	25.57	42.22	22.44	18.10	3.98	15.42	7.74	526	19.19
Metator pardalinus Sauss.	--	--	3.98	2.22	5.91	9.52	1.14	5.73	--	111	4.05
Opeia obscura Thos.	--	.43	1.14	1.11	--	--	4.55	.22	--	28	.81
Orphulella pelidna Burm.	--	--	--	.56	--	--	--	--	--	1	.04
Orphulella speciosa Scudd.	1.20	--	--	1.11	1.57	--	--	--	--	7	.26
Phlibostroma quadrimaculatum Thos.	--	.87	10.68	1.11	5.51	.32	4.55	1.98	--	130	4.74
Phoetaliotes nebrascensis Thos.	--	--	3.86	--	.79	--	--	.66	.60	40	1.46
Schistocerca lineata Scudd.	--	--	.11	--	--	--	--	--	--	1	.04
Spharagemon bolli Scudd.	1.20	--	--	--	--	--	--	--	--	1	.04
Spharagemon collare Scudd.	--	.43	--	--	6.30	--	1.14	.22	4.76	27	.99
Spharagemon equale Say	1.20	1.30	.80	.56	--	--	--	.44	--	1	.04
Trimerotropis agrestis McNeill	--	--	--	--	--	--	--	.22	--	1	.04
Trimerotropis laticincta Sauss.	--	--	--	--	--	--	--	.22	--	1	.04
Trimerotropis pallidipennis Burm.	--	--	.11	--	--	--	--	--	--	1	.04
Total specimens per environment	83	231	880	180	254	315	176	454	168	--	--



South Dakota

Small grains

Percent

1.	Melanoplus mexicanus-----	52
2.	Dissosteira carolina-----	27
3.	Ageneotettix deorum-----	5
4.	Camnula pellucida-----	5
5.	Melanoplus femur-rubrum----	5
6.	Five others-----	6

Roadside

1.	Melanoplus mexicanus-----	26
2.	Mestobregma kiowa-----	9
3.	Ageneotettix deorum-----	8
4.	Derotmema haydenii-----	7
5.	Melanoplus femur-rubrum----	6
6.	Twenty-two others-----	44

Plains grassland

1.	Mestobregma kiowa-----	26
2.	Ageneotettix deorum-----	25
3.	Philibostroma quadrimaculatum--	11
4.	Melanoplus mexicanus-----	8
5.	Amphitornus coloradus-----	7
6.	Twenty-two others-----	23

Legumes

1.	Mestobregma kiowa-----	42
2.	Ageneotettix deorum-----	19
3.	Melanoplus mexicanus-----	7
4.	Melanoplus femur-rubrum----	6
5.	Drepanopterna femoratum----	5
6.	Nineteen others-----	21

Railroad right-of-way

1.	Melanoplus mexicanus-----	43
2.	Ageneotettix deorum-----	26
3.	Mestobregma kiowa-----	8
4.	Melanoplus packardii-----	6
5.	Spharagemon collare-----	5
6.	Seven others-----	12

Pasture grassland

Percent

1.	Ageneotettix deorum-----	26
2.	Mestobregma kiowa-----	22
3.	Melanoplus mexicanus-----	15
4.	Spharagemon collare-----	6
5.	Metator pardalinus-----	6
6.	Fifteen others-----	25

Low mountain grassland

1.	Ageneotettix deorum-----	22
2.	Mestobregma kiowa-----	18
3.	Aulocara elliotti-----	15
4.	Metator pardalinus-----	10
5.	Melanoplus angustipennis----	9
6.	Eleven others-----	26

Weedy patches

1.	Melanoplus mexicanus-----	16
2.	Drepanopterna femoratum-----	12
3.	Aulocara elliotti-----	12
4.	Dissosteira carolina-----	9
5.	Hadrotettix trifasciatus-----	7
6.	Sixteen others-----	44

River Bottom

1.	Mestobregma kiowa-----	15
2.	Ageneotettix deorum-----	14
3.	Drepanopterna femoratum-----	11
4.	Aeoloplus turnbullii-----	8
5.	Melanoplus lakinus-----	8
6.	Twenty-three others-----	44

Percentage of grand total

1.	Ageneotettix deorum-----	19
2.	Mestobregma kiowa-----	19
3.	Melanoplus mexicanus-----	13
4.	Philibostroma quadrimaculatum--	5
5.	Aulocara elliotti-----	4
6.	Forty-two others-----	40

UTAH

Most of the natural vegetation of the State is desert shrub composed of sagebrush, or northern-desert shrub, and greasewood, or salt-desert shrub.

The collections contained 2,040 specimens, representing 23 species taken in about 8 environments. The dominant species was Melanoplus mexicanus with M. femur-rubrum a close second in numbers, and Trimerotropis vinculata third. The worst infestations were in the north-central part, and there were light infestations throughout the farming district.

Distribution by species of 2,040 specimens collected in Utah, expressed in percentage of total number collected in each habitat

Species	Alfalfa for seed	Alfalfa and stubble	Orchard	Pasture	Meadow	Small grain	Mix-ture	Corn	Stubble	Total specimens	Percentage of grand total
Aeoloplus turnbullii Thos.---	--	1.86	--	--	--	--	--	--	--	7	0.34
Ageneotettix deorum Scudd.---	--	0.11	--	--	--	--	0.38	--	--	1	.10
Arphia pseudonietana Thos.---	--	.44	--	--	2.48	--	.38	--	0.56	10	.49
Aulocara eliotti Thos.---	1.00	.44	--	--	--	--	--	--	--	13	.64
Camula pelucida Scudd.---	1.00	8.87	--	--	28.10	26.67	1.15	4.55	7.87	147	7.21
Chortanippus curtipes Harris.	--	1.33	--	--	24.80	--	--	--	--	42	2.06
Dissosteira carolina L.---	4.00	3.77	4.17	9.76	2.48	20.00	3.45	22.73	7.87	101	4.95
Dissosteira spurcata Sauss.---	--	--	--	--	--	--	--	--	--	2	.10
Drepanopterna femoratum Scudd.	3.00	.11	4.17	--	--	--	--	--	--	6	.29
Hesperotettix viridis Thos.---	--	--	4.17	--	--	--	--	--	--	4	.20
Melanopl.---	--	.33	--	--	20.66	--	.77	--	--	30	1.47
Melanoplus angustipennis Dodge	--	.22	--	--	--	--	--	--	--	2	.10
Melanoplus bivittatus Say---	--	1.33	--	2.44	.83	--	2.30	4.55	3.37	32	1.57
Melanoplus differentialis Thos.	--	.55	--	--	--	--	.77	--	--	7	.34
Melanoplus femur-rubrum Deg.	18.00	22.06	20.83	14.63	9.09	--	26.82	31.82	29.78	467	22.89
Melanoplus mexicanus Sauss.---	28.00	29.16	4.17	14.63	9.09	33.33	25.67	9.09	27.53	546	26.76
Melanoplus packardii Scudd.---	32.00	8.65	12.50	7.32	--	--	9.96	9.09	6.18	216	10.59
Merimria maculipennis Rehn---	--	8.78	8.33	--	--	--	1.15	--	--	12	.59
Mestobregma kiowa Thos.---	1.00	.55	--	21.95	.83	--	.77	--	.56	21	1.03
Schistocerca shoshone Thos.---	--	--	--	--	--	--	.38	--	--	1	.10
Schistocerca lineata Scudd.---	--	.11	--	--	--	--	1.15	--	.56	6	.29
Spharagemon collaris Scudd.---	--	.55	--	--	--	--	1.15	--	.56	6	.29
Spharagemon equale Say-----	--	1.11	--	--	--	--	--	4.55	1.69	15	.74
Trimerotropis vinculata Scudd.	12.00	19.51	41.70	26.83	1.65	20.00	24.90	13.64	11.80	338	16.57
Total specimens per environment-----	100	902	376	24	41	121	15	261	22	178	



Utah

Alfalfa for seed

Percent

1. Melanoplus packardii-----	32
2. Melanoplus mexicanus-----	28
3. Melanoplus femur-rubrum-----	18
4. Trimerotropis vinctulata-----	12
5. Dissosteira carolina-----	4
6. Five other species-----	6

Alfalfa

1. Melanoplus mexicanus-----	29
2. Melanoplus femur-rubrum-----	22
3. Trimerotropis vinctulata-----	20
4. Cammula pellucida-----	9
5. Melanoplus packardii-----	9
6. Fifteen other species-----	11

Stubble and alfalfa

1. Melanoplus mexicanus-----	30
2. Melanoplus femur-rubrum-----	26
3. Melanoplus packardii-----	16
4. Trimerotropis vinctulata-----	9
5. Dissosteira carolina-----	6
6. Eleven other species-----	13

Orchard

1. Trimerotropis vinctulata-----	42
2. Melanoplus femur-rubrum-----	21
3. Melanoplus packardii-----	12
4. Mermeria maculipennis-----	8
5. Dissosteira carolina-----	4
6. Three other species-----	13

Corn

1. Melanoplus femur-rubrum-----	32
2. Dissosteira carolina-----	23
3. Trimerotropis vinctulata-----	14
4. Melanoplus mexicanus-----	9
5. Melanoplus packardii-----	9
6. Three others-----	13

Pasture

Percent

1. Trimerotropis vinctulata-----	27
2. Nestobregma kiowa-----	22
3. Melanoplus femur-rubrum-----	15
4. Melanoplus mexicanus-----	15
5. Dissosteira carolina-----	10
6. Three other species-----	11

Meadow

1. Cammula pellucida-----	28
2. Chorthippus curtipennis-----	25
3. Melanopli-----	21
4. Melanoplus femur-rubrum-----	9
5. Melanoplus mexicanus-----	9
6. Five other species-----	8

Small grain

1. Melanoplus mexicanus-----	33
2. Cammula pellucida-----	27
3. Dissosteira carolina-----	20
4. Trimerotropis vinctulata-----	20
5. No other species-----	

Mixture

1. Melanoplus femur-rubrum-----	27
2. Melanoplus mexicanus-----	26
3. Trimerotropis vinctulata-----	25
4. Melanoplus packardii-----	10
5. Dissosteira carolina-----	3
6. Ten other species-----	9

Stubble

1. Melanoplus femur-rubrum-----	30
2. Melanoplus mexicanus-----	28
3. Trimerotropis vinctulata-----	12
4. Cammula pellucida-----	8
5. Dissosteira carolina-----	8
6. Seven other species-----	14

Percentage of grand total

1. Melanoplus mexicanus-----	27
2. Melanoplus femur-rubrum-----	23
3. Trimerotropis vinctulata-----	17
4. Melanoplus packardii-----	11
5. Cammula pellucida-----	7
6. Nineteen other species-----	15

WISCONSIN

The whole of Wisconsin is in the eastern forest region and the natural vegetation areas are as follows:

1. Jack, red, and white pines--northern part.
2. Birch, beech, maple, and hemlock association--northern part.
3. Oak hickory association--southern part.

Like Michigan, there is a lot of cut-over stump land, small pasture, and hay meadow which, under extreme drought and overpasturing, furnishes ideal breeding grounds for Melanoplus mexicanus and Commula pellucida. The vegetation is very lush, affording an abundance of plant cover.

Most of the specimens are from pasture grassland. Altogether, 789 specimens were taken, representing only 9 species. Only 3 habitats were included. According to the collections, M. femur-rubrum formed over 80 percent of the population. C. pellucida has been the dominant species for several years. The rains or foggy weather in June just about wiped out this species, as well as the general infestations. The severe infestations have shifted to the southern part of the State.

Distribution by species of 739 specimens collected in Wisconsin, expressed in percentage of total number collected in each habitat

Species	Pasture grass land	Small grains	Alfalfa	Total specimens	Percentage of grand total
<i>Camula pellucida</i> Scudd.	2.82	.56	--	15	1.81
<i>Caortkipus curtippennis</i> Harr.	--	1.12	--	2	.25
<i>Dissosteira carolina</i> L.	--	1.12	--	2	.25
<i>Encoptolophus costalis</i> Scudd.	1.21	--	--	6	.76
<i>Melanoplus dawsoni</i> Scudd.	.40	--	--	2	.75
<i>Melanoplus femur-rubrum</i> DeG.	76.01	93.85	100.00	659	83.52
<i>Melanoplus mexicanus</i> Sauss.	17.94	3.35	--	95	12.04
<i>Mestobregma kiowa</i> Thos.	1.41	--	--	7	.89
<i>Spharagemon collaris</i> Scudd.	.20	--	--	1	.13
Total specimens					
per environment	496	179	114	--	--



Wisconsin

Pasture grassland

	<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> -----	76
2. <i>Melanoplus mexicanus</i> -----	18
3. <i>Camnula pellucida</i> -----	3
4. <i>Mestobregna kiowa</i> -----	1
5. <i>Encoptolophus costalis</i> -----	1
6. Two other species-----	1

Alfalfa

1. <i>Melanoplus femur-rubrum</i> -----	100
---	-----

Small grains

	<u>Percent</u>
1. <i>Melanoplus femur-rubrum</i> -----	94
2. <i>Melanoplus mexicanus</i> -----	3
3. <i>Chorthippus curtipennis</i> -----	1
4. <i>Dissosteira carolina</i> -----	1
5. <i>Camnula pellucida</i> -----	1

Percentage of grand total

1. <i>Melanoplus femur-rubrum</i> -----	83
2. <i>Melanoplus mexicanus</i> -----	12
3. <i>Camnula pellucida</i> -----	2
4. <i>Mestobregna kiowa</i> -----	1
5. <i>Encoptolophus costalis</i> -----	1
6. Four other species-----	1

WYOMING

All of the collections were made in either the short grass or northern desert shrub areas. The natural vegetation areas in this State are subdivided as follows (the mountain regions are not included):

1. Northern desert shrub or sagebrush area:

All of the State west of the Laramie and Big Horn Mountains except the mountain areas.

2. Short-grass region:

- (a) Grama grass--most of the extreme eastern part of Wyoming to the Black Hills and down the eastern border.
- (b) Western wheatgrass and sagebrush--a strip just east of the Big Horn Mountains.
- (c) Grama and mountain sage--a narrow strip fronting the eastern slope of the Big Horn and Laramie Mountains.

There were 4,385 specimens in the collections mostly from alfalfa. Six habitats are represented and 42 species were taken. Melanoplus mexicanus was dominant, with Camnula pellucida a close second. It was only in this State that M. bivittatus was at all numerous. It ranked third. Practically all the collections were confined to the northern counties.

The infestations were mostly limited to the six northern counties. Outside of these there were few and light infestations. The distribution of the species was about the same in the crops. In the plains grassland C. pellucida was dominant in 1935 at 23 percent and a minor species at 60 percent in 1934. This was the greatest change.

Species	Small grains	Legumes	Road-side	Plains grass-land	Corn	Creek bottom	Total specimens	Percentage of grand total
<i>Aeolopus turnbullii</i> Thos.	2.73	0.47	0.51	2.26	--	3.70	55	1.25
<i>Ageneotettix deorum</i> Scudd.	.68	2.20	.26	12.72	9.41	8.23	168	3.83
<i>Amphitornus bicolor</i> Thos.	1.14	.26	--	4.70	--	--	44	1.00
<i>Arphis pseudonietana</i> Thos.	.23	.35	--	.17	--	2.88	18	.41
<i>Aulocara elliotti</i> Thos.	1.14	1.21	1.54	6.45	1.18	6.17	101	2.30
<i>Brachystola magna</i> Gir.	--	--	--	2.89	--	.82	18	.41
<i>Bruneria brunnea</i> Thos.	--	.04	--	--	--	--	1	.02
<i>Camula pellucida</i> Scudd.	8.66	24.60	5.90	23.34	5.88	1.65	902	20.57
<i>Chorthippus curtipennis</i> Harr.	--	.79	--	.35	--	.82	9	.21
<i>Cordillacris crenulata</i> Brun.	--	--	--	.17	--	--	1	.02
<i>Cratypedes neglectus</i> Thos.	1.14	.04	--	--	--	--	6	.14
<i>Derotmema haydenii</i> Thos.	--	.04	--	--	1.18	--	9	.21
<i>Dissosteira carolina</i> L.	1.14	.82	.77	1.05	.59	2.47	36	.82
<i>Drepanopterna femoratum</i> Scudd.	--	.08	--	4.18	.59	--	27	.62
<i>Encoptolophus costalis</i> Scudd.	--	--	.26	.17	--	--	3	.07
<i>Gomphoceris clavatus</i> Thom.	--	.04	--	.87	--	--	1	.02
<i>Hadrotettix trifasciatus</i> Say	.46	.30	--	.35	.59	.41	6	.14
<i>Hesperotettix viridis</i> Thos.	--	.04	--	1.05	--	--	13	.30
<i>Hypochlora alba</i> Dodge	--	--	--	2.09	--	--	7	.16
<i>Melanoplus angustipennis</i> Dodge	.91	.39	--	6.45	14.71	6.58	67	1.53
<i>Melanoplus bivittatus</i> Say	25.06	22.96	11.28	2.09	4.71	8.64	784	17.88
<i>Melanoplus bowditchi</i> Scudd.	--	.26	.70	.59	2.06	--	12	.27
<i>Melanoplus confusus</i> Scudd.	--	.04	--	--	--	--	1	.02
<i>Melanoplus dawsoni</i> Scudd.	.23	.13	--	--	--	--	4	.09
<i>Melanoplus differentialis</i> Thos.	--	--	--	.35	--	3.70	11	.25
<i>Melanoplus femur-rubrum</i> DeG.	20.27	14.59	42.31	1.74	5.29	25.51	688	15.69
<i>Melanoplus gladstoni</i> Scudd.	--	.04	--	.35	--	--	3	.07
<i>Melanoplus infantilis</i> Scudd.	.46	.43	--	.70	1.18	--	18	.41
<i>Melanoplus keeleri luridus</i> Dodge	--	.12	--	--	--	--	3	.07
<i>Melanoplus mexicanus</i> Sauss.	25.97	24.69	31.79	18.82	25.88	10.29	1006	22.94
<i>Melanoplus occidentalis</i> Thos.	--	.04	--	.87	--	--	7	.16
<i>Melanoplus packardii</i> Scudd.	7.29	2.93	3.08	1.39	5.29	1.23	144	3.28
<i>Mermiria maculipennis</i> Rehn	--	--	--	--	--	.41	1	.02
<i>Mestobrega kiowa</i> Thos.	--	.86	.51	1.57	14.71	.41	58	1.32
<i>Metator pardalinus</i> Sauss.	.46	1.55	1.03	.87	--	8.23	76	1.73
<i>Opala obscura</i> Thos.	--	.04	--	.70	3.54	--	11	.25



Wyoming (Cont'd.)

Species	Small grains	Legumes	Road-side	Plains grass-land	Corn	Creek bottom	Total specimens	Percentage of grand total
<i>Philibotroma quadrinaculatum</i> Thos.	--	--	--	2.09	--	--	14	.32
<i>Phaetaliotes nebrascensis</i> Thos.	--	.04	--	--	--	2.47	7	.16
<i>Sphaeragemon collaris</i> Scudd.	1.59	.08	.51	.35	2.94	2.88	26	.59
<i>Sphaeragemon equale</i> Say	--	.17	--	--	.59	.41	7	.16
<i>Trimerotropis pistrinaria</i> Sauss.	--	--	--	--	1.18	--	3	.07
<i>Trimerotropis pallidipennis</i> Burm.	.46	.17	--	.17	--	--	7	.16
Total	439	2317	390	574	170	243	--	--
Specimens per environment								

Wyoming

Small grains

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	26
2. <i>Melanoplus bivittatus</i> -----	25
3. <i>Melanoplus femur-rubrum</i> -----	20
4. <i>Camnula pellucida</i> -----	9
5. <i>Melanoplus packardii</i> -----	7
6. Fourteen others-----	13

Legumes

1. <i>Melanoplus mexicanus</i> -----	25
2. <i>Camnula pellucida</i> -----	25
3. <i>Melanoplus bivittatus</i> -----	23
4. <i>Melanoplus femur-rubrum</i> -----	15
5. <i>Melanoplus packardii</i> -----	3
6. Twenty-nine others-----	30

Roadside

1. <i>Melanoplus femur-rubrum</i> -----	42
2. <i>Melanoplus mexicanus</i> -----	32
3. <i>Melanoplus bivittatus</i> -----	11
4. <i>Camnula pellucida</i> -----	6
5. <i>Melanoplus packardii</i> -----	3
6. Nine others-----	6

Corn

	<u>Percent</u>
1. <i>Melanoplus mexicanus</i> -----	26
2. <i>Melanoplus angustipennis</i> -----	15
3. <i>Metatrogia kiowa</i> -----	15
4. <i>Ageneotettix deorum</i> -----	9
5. <i>Camnula pellucida</i> -----	6
6. Fourteen others-----	29

Creek Bottoms

1. <i>Melanoplus femur-rubrum</i> -----	26
2. <i>Melanoplus mexicanus</i> -----	10
3. <i>Melanoplus bivittatus</i> -----	9
4. <i>Ageneotettix deorum</i> -----	8
5. <i>Metatrogia kiowa</i> -----	8
6. Sixteen others-----	39

Plains grassland

1. <i>Camnula pellucida</i> -----	23
2. <i>Melanoplus mexicanus</i> -----	19
3. <i>Ageneotettix deorum</i> -----	13
4. <i>Aulocara elliotti</i> -----	6
5. <i>Melanoplus bivittatus</i> -----	6
6. Twenty-seven others-----	33

Percentage of grand total

1. <i>Melanoplus mexicanus</i> -----	23
2. <i>Camnula pellucida</i> -----	21
3. <i>Melanoplus bivittatus</i> -----	18
4. <i>Melanoplus femur-rubrum</i> -----	16
5. <i>Ageneotettix deorum</i> -----	4
6. Thirty-seven others-----	18

DOMINANT SPECIES IN STATES WHERE NO COLLECTIONS ARE RECORDED

There are five States for which we have no collections and these are listed with their dominant species. No attempt is made to show any distribution other than the order of their importance for the first three. All of the infestations were light in these States.

ARIZONA

Melanoplus mexicanus, M. femur-rubrum, Trimerotropis pallidipennis, M. gladstoni, M. lakinus Scudd., M. differentialis, M. pictus Scudd., Dissosteira carolina.

CALIFORNIA

Camnula pellucida, Melanoplus mexicanus, M. marginatus Scudd., M. femur-rubrum, M. differentialis, Oedaleonotus enigma Scudd., Hippiscus californicus Scudd., Schistocerca venusta Scudd., S. vaga Scudd., Dissosteira spurcata, M. packardii, Aulocara femoratum Scudd., Oedaleonotus borckii var. pacificus Scudd., Trimerotropis vinculata.

IDAHO

Melanoplus mexicanus, Camnula pellucida, M. bivittatus, Dissosteira carolina, Cratypedes neglectus.

KANSAS

Melanoplus mexicanus, M. differentialis, M. bivittatus, M. femur-rubrum.

NEVADA

The only species recorded in the report for Nevada was Camnula pellucida.

NEW MEXICO

Melanoplus bivittatus, M. differentialis, M. femur-rubrum.

OREGON

Camnula pellucida, Melanoplus femur-rubrum, M. bivittatus.



### SUMMARY

Probably the greatest change that took place in the relative abundance of species was that which happened to the Cannula pellucida and Melanoplus mexicanus populations in North Dakota, Minnesota, Wisconsin, and Michigan. C. pellucida either equaled or exceeded M. mexicanus in 1934. In many places heavy infestations of C. pellucida hatched in June but cold, foggy weather practically wiped out these outbreaks, reducing the numbers of this species almost to a minimum. M. mexicanus was also affected but not to the extent that C. pellucida was. M. mexicanus was dominant in about 10 States and C. pellucida in 4 out of the 18.

Ageneotettix deorum was an important species in all the States east of the Continental Divide. It is widely distributed and abundant in small grains, field margins, legumes, and grasslands. Another important species was Encoptolophus costalis, which was numerous in Michigan, Wisconsin, Minnesota, and eastern North Dakota. Philibostroma quadrimaculatum was prominent in the short-grass areas in pasture and on the range. Other important species of the rangeland in the short-grass areas were Cordillacris crenulata, which was dominant in Montana; Aulocara ellioti, Drepanopterna femoratum, Mestobregma kiowa, and M. infantilis. Considerable damage was done to the rangeland and it was observed that under ordinary conditions of correct grazing native grasses will support populations of 7 or 8 per square yard without visible damage. When these increase to 15 per square yard the damage becomes severe, and at 20 or 30 the foliage is kept chewed to the crown, making the range unfit for pasturing.

M. femur-rubrum was important and dominant in many places, reaching its greatest abundance in the legumes. It was the dominant species in 3 States. M. bivittatus was of importance in 5 or 6 States, but the numbers of this species are still down. Both this and M. differentialis are building up again along the water courses of South Dakota and Nebraska.

With increased moisture in the drought areas, M. bivittatus and M. differentialis will have more succulent food and a chance to build up again. Increased moisture in Wisconsin and Michigan last summer caused tall weeds and grass to grow up in favorite egg-laying places of C. pellucida, which are unfavorable conditions for this species. Therefore changes in weather also bring about changes in the optimum conditions for the development of certain species.



## THE MORE IMPORTANT RECORDS FOR JULY 1936

The grasshopper situation continued to be very serious throughout July. During the month extensive flights were reported from the Dakotas, Montana, Iowa, Nebraska, and Kansas.

The alfalfa weevil has recently been reported from Fall River County, S. Dak., Daves and Box Butte Counties, Nebr., Eagle County, Colo., and Harney County, Oreg.

Webworms (Loxostege spp.) were seriously abundant in Minnesota, North Dakota, Nebraska, and Utah, and several thousand acres of cotton were ruined by the garden webworm in Oklahoma.

Japanese beetle is generally prevalent throughout the Middle Atlantic States.

A new infestation of the introduced weevil Calomycterus setarius Roelofs was discovered at Fairfield, Conn.

Associated with the hot, dry weather, heavy infestations of red spiders on a wide variety of plants were reported from Maryland westward through Kentucky and Ohio to the Pacific coast, and southward to the Gulf.

A detailed hessian fly survey for Ohio is reported in this number of the Bulletin. The infestation is about one-half of that reported in 1935.

Hot, dry weather early in July accelerated the movement of chinch bugs from small grains and grass into corn. Scattered damage was reported throughout the greater part of the chinch bug belt.

The fall armyworm developed outbreak numbers in parts of Puerto Rico during the early part of July. During the third week in the month this insect was found in several parts of Florida.

Heavy infestations of rose chafer were reported from Wisconsin and Minnesota.

The peak of codling moth emergence occurred during the first week in the month in the Middle Atlantic States and during the second week in the East Central States. Heavy injury is reported in the latter region.

The raspberry sawfly was discovered for the first time in Fremont County, Idaho, in June.



Heavy populations of the grape leafhopper were reported from Utah and California.

Serious damage to walnuts and pecans by the walnut caterpillar was reported from Nebraska southward to south Texas.

Blister beetles were generally prevalent and destructive in Maryland westward to North Dakota and Kansas, being particularly prevalent in the regions where grasshoppers have been occurring in the last few years.

The false chinch bug was reported in destructive numbers from Michigan to the Dakotas and Kansas.

The Colorado potato beetle was especially numerous in the Lake States.

The turnip seed weevil (Ceutorhynchus assimilis Payk.) is established in western Washington and Oregon, and is doing considerable damage to mustard and cabbage seeds.

The squash bug was generally abundant over the Middle Atlantic and East Central States and westward to Colorado.

A tortoise beetle, Gratiana pallidula Boh., was reported to be injuring eggplants in the District of Columbia and in Ohio.

Over the greater part of the Cotton Belt from Oklahoma eastward boll weevil was generally scarce. In Texas control measures were necessary over the greater part of the State.

On July 17 the cotton leaf worm was recorded from Tallulah, La., and on July 16 from Jefferson County, Ark.

Cotton aphids were reported as very abundant in Tennessee, Louisiana, and Mississippi.

The satin moth seems to have been increasing in destructiveness throughout the New England States.

The mountain ash sawfly is causing considerable defoliation of mountain ash in the northern New England States.

An unusual infestation of pine by Tortrix pallorana Rob. was reported from Michigan.

During the month 11 cases of Rocky Mountain spotted fever have been reported from Maryland. This brings the year's total to 17 cases, 4 of which have been fatal. The American dog tick has been very prevalent in the State this year.

Screw worm infestations were generally reduced in the Southeastern States, but are still quite numerous in the West, cases having been recorded from Texas northward to northern Oklahoma.

GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Ohio. T. H. Parks (July 18): Serious injury to one field of corn was reported from Preble County on July 18. Bran-mash bait was applied. One fruit grower in Erie County applied bran mash to protect young trees. Grasshoppers are unusually scarce in meadows and pastures elsewhere in the State.

Indiana. J. J. Davis (July 20): Grasshoppers are being reported from widely separated points in the State, but in only six northern counties are the infestations general. Melanoplus mexicanus Sauss. is full grown. M. differentialis Thos. is present in rather large numbers, the majority being from one-half to two-thirds grown.

Illinois. W. P. Flint (July 20): Many areas in the northern three-fourths of the State are being damaged by grasshoppers. They are more abundant in the central counties with bad spots in the northwestern and northern parts of the State. Many of the hoppers are still in the second instar, while many others are full grown. The principal species in the northern part of the State is M. differentialis. In the other parts of the State the differential and the red-legged grasshopper (M. femur-rubrum Deg.) are the two species most commonly found.

Wisconsin. E. L. Chambers (July 20): The red-legged grasshopper has done serious injury to alfalfa and corn over a rather large area in Waukesha County this summer. This species has never before been recorded in Wisconsin as serious. M. mexicanus and Camnula pellucida Scudd. have done serious injury to hay and small grains and are beginning on the corn in 12 southern counties that had never heretofore been seriously damaged by grasshoppers. Active campaigns for control are in progress in 18 counties and nearly 1,000 tons of mixed bait have already been used.

Minnesota. A. G. Ruggles (July 22): Grasshoppers are becoming quite abundant in Hennepin, Ramsey, and Washington Counties, destroying garden crops and stripping leaves from trees in orchards. A few other counties in the western part of the State have hoppers building up a population.

Iowa. C. J. Drake (July 24): Grasshoppers are doing a lot of damage in western and southern Iowa. In the central and southern parts of the State hatching is not yet completed. The hatch has been very irregular over the entire State this year. This has made control very difficult. In 14 of 15 counties they have destroyed over 50 percent of the oats and barley. Alfalfa, sweetclover, and red clover have suffered extensively. Over 75 percent of the new plantings have been destroyed in from 40 to 50 counties. Old plantings of alfalfa have suffered extensively where untreated. Corn growing adjacent to sweetclover, alfalfa, small-grain, and pasture fields has suffered a great deal from the hoppers. The two-lined (M. bivittatus Say), the lesser migratory locust (M. mexicanus), and the differential are the three most common species. The differential hatched much later than the other two species. Many apple trees are



being defoliated and willows, poplars, and other trees in the heavily infested area have been almost entirely defoliated.

Missouri. L. Haseman (July 24): The grasshopper situation is still serious. The entire western half of the State was involved in the epidemic this year and the damage has been due largely to the red-legged grasshopper, combined with apparently the migratory species (M. mexicanus), the differential, and the two-lined. Many acres of corn have been completely stripped where poisoned bait was not promptly used, and garden crops, alfalfa, and other field crops have suffered. Between four and five million pounds of bran has been used in bait, and fortunately the bait this year has apparently given unusually good kills.

North Dakota. F. Gray Butcher (July 21): Grasshoppers are reported as very abundant in 20 counties and moderately abundant in the remainder of the State, except in the eastern counties. During the recent period of extremely high temperatures, numerous small flights of hoppers were reported, which has resulted in a somewhat more general distribution throughout the State. Some destruction to flax and corn is being reported

South Dakota. H. C. Severin (July 18): The drought has become state-wide and naturally the grasshopper situation has become worse. We are having a terrific outbreak of grasshoppers, and they are destroying much of the grass on the ranges. They are also moving into alfalfa, corn, and cane, and are doing much damage. M. bivittatus, M. mexicanus, M. differentialis, Dissosteira carolina L., Aulocara ellioti Thos., C. pellucida, Mestobregma kiowa Thos., and Metator pardalinus Sauss. are the most important species. Only a few counties in the extreme eastern section of the State are not infested. We are having flights of grasshoppers from the south.

Nebraska. M. H. Swenk (July 24): From June 20 to July 19 infestation increased markedly, both in extent and intensity. During the first 10 days in June the area of damage increased to include northeastern and southwestern Nebraska, and Dawes County, in northwestern Nebraska. Between June 10 and 20 most of central Nebraska, outside of the sandhills, and the southern part of the Panhandle became new centers of damage. During the month following, the infested area increased so as to involve 83 of the 93 counties. About 2,000 tons of poisoned bran-mash bait were distributed exclusive of large amounts distributed by individual farmers; yet crop damage has been severe in many places. The species chiefly responsible for crop damage have been the two-striped, the differential, the red-legged, and the lesser migratory grasshoppers. On June 24 a spectacular flight of the lesser migratory grasshopper occurred across southeastern Nebraska. The insects were sighted late in the morning in south-central Nebraska, in the vicinities of Hebron, in Thayer County; Nelson, in Nuckolls County; Clay Center, in Clay County; Hastings, in Adams County; and as far west and south as Franklin, in Franklin County. Around midday they were noted at York, in York County; Seward, in Seward County; and Crete, in Saline County. They were first noted above Lincoln about 1 p.m., and reached Omaha, in Douglas County, Nebraska City, in Otoe County, and western Iowa about 3 p.m. The course of the flight was from southwest to northeast and at times and places there were large numbers



in the air. On June 27 a similar flight of this species was noted in Dawson County, especially in the vicinity of Lexington. Specimens from these flights were in many cases unusually long-winged individuals of the lesser migratory grasshopper, suggesting something of an approach to the Rocky Mountain grasshopper (M. mexicanus, migratory phase spretus Walsh). There was also a heavy flight of Mestobregma kiowa in the eastern part of Dawson County on July 9, when large numbers of individuals of this species dropped into the streets of Overton. About the middle of July scattered localities, all over eastern Nebraska, from as far north as Hartington, in Cedar County, south to Lincoln, reported loose flights of D. carolina and D. longipennis Thos., in some of which the insects were abundant. Many of these migrating grasshoppers were reported to be infested with the locust mite (Eutrombidium trigonum Hermann).

Kansas. H. R. Bryson (July 23): During the past month the grasshoppers have done some damage to crops in practically every county in the State, Melanoplus differentialis, M. bivittatus, and M. mexicanus being most abundant. Young peach trees have been stripped of their leaves, the bark of twigs girdled, and the green fruit destroyed. Professor G. A. Dean found them causing considerable injury to nursery trees at Manhattan. Adults of M. mexicanus were flying into fields, so that a new population came into the nursery from elsewhere. They were observed clustered and feeding on the fruits, leaves, and on the bark of the smaller twigs of Osage orange. A high percentage of them are parasitized by Sarcophaga kellyi Ald. Parasites, applied control measures, and extremely high temperatures have had a decided effect during the past week in reducing the grasshopper population.

Tennessee. G. M. Bentley (July 16): The County Agent in Humphreys County reported on July 2 that M. femur-rubrum had ravaged more than 100 acres and seemed to be spreading.

Mississippi. C. Lyle (July 23): A complaint of serious injury was received from Pace on June 27. Corn, cotton, soybeans, and alfalfa were being attacked. M. differentialis was the chief species concerned, although other species were present.

Arkansas. D. Isely (July 22): Arkansas is experiencing the first severe general outbreak of which the Department of Entomology has any record. There have been local outbreaks before, but none which compare in any way with the present one. About 115,000 acres of row crops have been damaged, including corn, cowpeas, soybeans, and cotton, with the worst damage to corn. Most of this injury is in the northern two tiers of counties, about 83,000 acres being in the north tier of counties. The heavily infested area is more than double that in which serious injury has occurred. The species involved in order of importance are M. differentialis, M. mexicanus, and M. femur-rubrum.

Oklahoma. C. F. Stiles (July 25): Grasshoppers are continuing to destroy corn, cotton, and legumes throughout the greater part of Oklahoma. The entire State with the exception of the southeast corner is heavily infested. The severe drought has caused the farmers to slacken their fight against

this pest in all of the State except where cotton is grown. The hoppers are extremely difficult to control at this time, owing to high temperatures which cause the poison to dry out rapidly. They have taken to the trees and shrubs throughout the State and to the cotton fields where the cotton is largest and can afford them shade. The species most numerous are M. differentialis, M. bivittatus, M. mexicanus, and M. femur-rubrum. Grasshoppers (Xanthippus corallipes pantherinus Scudd.) invading Stillwater arrived just about dusk on June 10, being attracted by thousands to the lights. (Det. A. B. Gurney.)

Colorado. G. M. List (July 23): Hoppers continue to present a serious problem in some sections of the State. The infestation in the high altitudes and in the foothill areas is greater than was anticipated, and considerable damage is being done.

Idaho. C. Wakeland (July 22): Grasshoppers are slightly above normal in a few localities in southwestern and southeastern Idaho, and poisoning for control is being done in a small way in Ada, Jerome, Bannock, and Bear Lake Counties.

Utah. G. F. Knowlton (July 22): Hoppers are moderately abundant and attacking a wide variety of crops.

Oregon. B. G. Thompson (July): Grasshoppers are quite serious in the Willamette Valley for the first time in many years.

California. S. Lockwood (July 7): We are having considerable trouble from M. devastator Scudd. in the Sacramento and San Joaquin Valleys.

H. J. Ryan (July 20): Grasshopper infestations, the more prevalent species being the valley grasshopper (Oedaleonotus enigma Scudd.) and the lesser migratory locust (M. mexicanus) have been reported on beans growing near Newhall, in Los Angeles County. Inspection revealed that they had almost completely eaten 15 acres of beans, although some of the damage can be attributed to the drought. Bait has been applied along the foothills adjacent to the bean fields and results have been excellent.

#### MORMON CRICKET (Anabrus simplex Hald.)

Idaho. C. Wakeland (July 22): Mormon cricket control has been successful to the extent that it has protected growing crops from severe destruction, but the population in the State as a whole remains so large as to be alarming. Many new infestations have developed since last season. Organized control has been under way on a state-wide basis since April 1. At peak times over 400 men have been employed in operating dust guns. Kills have been exceptionally high and many bands have been completely wiped out without noticeably reducing the population. An undetermined species of wasp is attacking the crickets generally throughout the State. It first stings its victim, then drags it into a burrow in the ground and deposits a single egg on the left side of the thorax. The egg later hatches and the larva of the wasp consumes its host.



Utah. C. J. Sorenson (July 22): Mormon crickets in outbreak numbers have been observed in Juab County between Tintic and Sheeprock Mountains. Ranchers reported that this infestation extends over an area approximately 10 by 18 miles. Crickets have not been observed by ranchers in this locality in recent years until about a month ago.

COULEE CRICKET (Peranabrus scabricollis Thos.)

Washington. I. W. Bales (July 20): Coulee crickets are unusually numerous in Chelan County this season. Counts of dead crickets after dusting showed a population of 96 per square foot.

FIELD CRICKET (Gryllus assimilis Fab.)

South Dakota. H. C. Severin (July 18): Black field crickets are very abundant this year, more so than usual, on corn, alfalfa, and garden crops, and as household pests, chiefly in the western part of the State.

EUROPEAN EARWIG (Forficula auricularia L.)

New York. E. L. Denny (July 13): Specimens were found at the trunk of an apple tree in Rochester. The insect was identified by A. B. Gurney, who states: "This species has been established at Aurora near Buffalo for the past 10 years, therefore it is not strange to find it at Rochester."

Washington. E. W. Jones (July 21): Earwigs have been giving considerable trouble because of their invasion of houses in Walla Walla. In the older infested parts of the city they are as abundant as usual. They have spread throughout the entire city.

ARMYWORM (Cirphis unipuncta Haw.)

Wisconsin. E. L. Chambers (July 20): Outbreaks of armyworms have occurred in Pierce, Langlade, Douglas, and Wood Counties.

VARIEGATED CUTWORM (Lycophotia margaritosa saucia Hbn.)

Ohio. T. H. Parks (July 26): A serious outbreak of this cutworm is occurring on two celery farms near Cleveland. Celery is being badly damaged.

WEBWORMS (Loxostege spp.)

Minnesota. A. G. Ruggles (July 22): Adults of the sugar beet webworm (L. sticticalis L.) are very abundant at Wheaton. The larvae are destroying truck crops at Forest Lake and Anoka, corn leaves at Appleton, flax in Yellow Medicine County, and sugar beets in Clay County.

North Dakota. F. Gray Butcher (July 21): Sugar beet webworms have caused some injury to flax and gardens, particularly in the northern part of the State.

Utah. G. F. Knowlton (July 22): Although sugar beet webworm moths have been



moderately abundant this spring, general outbreaks have not as yet been reported.

Nebraska. M. H. Swenk (July 24): A Gage County correspondent sent in specimens of the garden webworm (L. similalis Guen.) on July 1, stating that the pest was destroying a field of corn.

#### WIREWORMS (Elateridae)

Kentucky. W. A. Price (July 25): An examination of tobacco plants on the experiment station farm at Lexington has shown a moderate infestation of Aeolus dorsalis Say.

Kansas. H. R. Bryson (July 23): Wireworms belonging to the genus Melanotus are very scarce. Adults of Monocrepidius vespertinus Fab. are plentiful.

California. M. W. Stone (July 7): Many lima bean plantings in the Greenville and Talbert districts of Orange County are showing extensive damage by sugar beet wireworm (Limonius californicus Mann.). A bean association reports that a 30-acre field was completely destroyed. (July 9): Adults of A. livens Lec. were collected in large numbers by A. F. Howland at lights at Brawley, in Imperial County, on June 17. A few were taken in light traps near Visalia in Tulare County on June 23.

#### WHITE GRUBS (Phyllophaga spp.)

Kentucky. W. A. Price (July 25): Adults of P. ephilida Say were reported on July 7 as abundant in fruit trees at Sandy Hook.

Nebraska. M. H. Swenk (July 24): On July 2 a Butler County correspondent reported that white grubs were bothering chrysanthemums in that locality.

Oregon. W. D. Edwards (July): White grubs in the Willamette Valley are damaging raspberries in the Gresham district.

#### ROSE CHAFER (Macrodactylus subspinosus Fab.)

Maine. H. B. Peirson (July): Heavy outbreaks of rose chafer in central Maine on grapes, raspberries, beans, and various trees and shrubs during June.

Wisconsin. E. L. Chambers (July 20): Serious losses in corn, garden crops, and shade trees resulted from the rose chafer in the light-sand areas of Monroe, Adams, Waushara, and Waupaca Counties.

Minnesota. A. G. Ruggles (July 22): Rose chafer abundant on roses in Minneapolis and St. Paul.

#### GREEN JUNE BEETLE (Cotinis nitida L.)

Kentucky. W. A. Price (July 25): A heavy flight of green June beetles began in the bluegrass district in July and continues to the present time.

A SCARABAEID (Ochrosidia immaculata Oliv.)

Kentucky. W. A. Price (July 25): The flight was delayed this year. The first heavy flight was observed at Lexington on July 12. Eggs and small larvae are common in pasture sod and near manure piles.

JAPANESE BEETLE (Popillia japonica Newm.)

New England. L. H. Worthley (July 18): Japanese beetles were first noted in New Hampshire at Concord on June 30 and at Keene on July 7. In Massachusetts the first beetle was taken in Boston on July 9, the day the traps were set. Sixteen hundred traps have been placed by the park department of Springfield, Mass. The first beetles caught in the city-owned traps were captured on June 27. The traps are now catching an average of 1,000 beetles per day. They caught 1,600 beetles on July 4.

Connecticut. W. E. Britton (July 22): Adults are very numerous in certain localities in Bridgeport, Hartford, and New Haven, and several complaints and inquiries have been received. Specimens have been brought to the office from Hamden, New Haven, and Southport.

Rhode Island. A. E. Stene (July 24): The Japanese beetle is increasing in abundance, especially in and around Providence.

New York and New Jersey. L. H. Worthley (July 27): It is apparent that there are heavy infestations of the Japanese beetle in practically all of the metropolitan district surrounding New York City. One of the heaviest infestations is reported on Governors Island in New York Harbor. The beetles have eaten the ivy that covers a part of the immigration station on Ellis Island. Staten Island may be considered generally infested with considerable damage in all parts of the island. The beetles have also reached the nuisance stage in Brooklyn from Fort Hamilton north to the Columbia Heights section. Reports of heavy infestation on Long Island have been received from Flushing, Bayside, Coney Island, and Long Beach. Upper Manhattan and the Bronx are also invaded with a greatly increased population, complaints having been received from the Kingsbridge Road in the Bronx, Manhattan College, and Van Courtlandt Park. Communities along the Hudson River north to Hastings-upon-Hudson are badly infested. Heavy infestations have been observed in sections of Essex and Hudson Counties in New Jersey.

T. L. Guyton (July 15): The first beetle was noticed on June 17. Beetles were numerous on fruit and shade trees at Bound Brook the first week in July.

Delaware. L. A. Stearns (July 24): Injury in the northern part of New Castle County is very severe--about at a maximum for the current season and possibly for the cycle of infestation as well.

Maryland. E. N. Cory (July 16): A great many reports of injury to roses, grapes, and most other plants are coming in from practically all over the State.



L. H. Worthley (July 18): Scout crews on the western shore of Maryland have been finding beetles rather consistently in nursery and greenhouse establishments and on farms. This year is the first time the crews have found beetles on the large bean-growing farms in Anne Arundel County. A few beetles were also captured at a sand pit in the northern part of the 9th election district of Baltimore County, a few hundred yards from the boundary of the regulated area. During the period June 25 to July 8, crews found beetles on 9 nursery and greenhouse premises, within 500 feet of 2 other commercial establishments, at 5 sand and soil establishments, and on 26 heretofore uninfested bean farms. Illustrative of the degree to which the population is building up on the Eastern Shore of the State is the removal of 165 beetles from 365 hampers of string beans inspected at Princess Anne in Somerset County.

West Virginia. D. L. Van Dine (July 20): Three specimens of adults were sent to this office by the county agent of Taylor County, with the report that they had been taken at Grafton.

A WEEVIL (Calomycterus setarius Roelofs)

Connecticut. M. P. Zappe (July 23): Adults began emerging about the middle of June. Many present on lespedeza, desmodium, and other legumes at Stratford. Also crawling up sides of houses in infested area. Now infestation found at Fairfield, where adults were feeding on clover in field.

Maryland. E. N. Cory (July 15): C. setarius is again abundant in Towson district, first appearing about June 21. Infestation nearly at an end. Found them in open field feeding on alfalfa on July 13.

COMMON RED SPIDER (Tetranychus telarius L.)

Ohio. T. H. Parks (July 22): The red spider is now very abundant on roses and other garden plants.

Wisconsin. E. L. Chambers (July 20): Serious infestations of red spider mites have been observed and reported from all over the State on evergreen, perennials, and raspberry bushes, on account of the severe dry spell for the past 3 weeks.

Kentucky. W. A. Price (July 25): Red spiders are very abundant over the State generally.

South Dakota. H. C. Severin (July): This pest is becoming more abundant and has done much damage to garden crops, hedge plants, trees, and flowering plants.

Missouri. L. Haseman (July 24): For the past 3 weeks red spider has been attracting attention on shrubs and raspberry, moving into orchards in northwestern Missouri and in some parts of southwestern Missouri.



Oklahoma. F. A. Fenton (July 20): On account of the dry weather, the infestation of red spiders is increasing at this time and is present in a good many cotton fields.

Mississippi. C. Lyle (July 23): During the dry weather of June, conifers in all parts of the State were seriously injured. Fewer complaints have been received since the general rains early in July, but this pest is still fairly abundant in most sections.

California. C. S. Morley (July 6): Red spider is doing considerable injury to ornamental trees in Kern County. Some sycamore trees are completely brown from spider injury.

Washington. E. J. Newcomer (July 27): Red spider is becoming numerous on hops in the Yakima Valley.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT

#### HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (July 22): The annual wheat insect survey made just before harvest showed the following percentages of straw infestation for each county:

Butler, 50.8	Harrison, 9.6	Medina, 4.4	Stark, 25.0
Champaign, 6.4	Henry, 4.8	Miami, 5.8	Summit, 13.8
Clermont, 25.7	Highland, 21.0	Montgomery, 20.4	Tuscarawas, 16.8
Columbiana, 14.2	Holmes, 7.4	Pickaway, 15.8	Trumbull, 5.8
Crawford, 8.0	Huron, 7.4	Portage, 7.8	Van Wert, 8.2
Darke, 14.4	Jefferson, 14.0	Putnan, 1.2	Wayne, 2.5
Delaware, 9.0	Knox, 11.4	Ross, 9.5	Wood, 1.4
Hardin, 5.4	Mahoning, 15.8	Seneca, 12.6	Warren, 24.9

The average infestation for the State is 12.4 percent, as compared to 26.4 percent in 1935. In only a few counties was there an increase. Practically no commercial loss resulted, as the infested straws did not lodge. Drought and heat caused heavy mortality in July. In one Pickaway County field only 4 percent of the puparia contained healthy larvae when examined on July 20.

Michigan. R. Hutson (July 17): Hessian fly caused considerable damage about Lapeer.

#### BLACK GRAIN-STEM SAWFLY (Trachelus tabidus Fab.)

Delaware. E. J. Udine (July 10): Surveys showed light infestations of T. tabidus in wheat fields throughout the State.

Maryland. E. J. Udine (July 10): Surveys showed the prevalence of light infestations of sawfly in wheat fields throughout the principal wheat-

growing regions.

Virginia. E. J. Udine and J. S. Pinckney (June 26): Surveys showed sawflies present in wheat fields in Fauquier, Loudoun, Shenandoah, Rockingham, Augusta, Westmoreland, King George, Caroline, Prince William, and Campbell Counties. There were insufficient numbers in any county to cause economic loss.

Pennsylvania. E. J. Udine (July 15): T. tabidus was generally prevalent throughout western Pennsylvania, and was particularly heavy west of Indiana County. Not as much damage was done as in previous years because the wheat ripened and was harvested shortly before the mature larva had completed severance of the wheat stem.

Ohio. E. J. Udine (July 15): Heavy infestations of sawfly were found in the eastern part of the State in Columbiana, Mahoning, and Stark Counties, with light infestations in Portage and Trumbull Counties.

#### EUROPEAN WHEAT STEM SAWFLY (Cephus pygmaeus L.)

Pennsylvania. E. J. Udine (July 15): The European wheat stem sawfly occurred in moderate but widespread infestations in most of the wheat fields of eastern Pennsylvania. It was not prevalent west of Centre County.

#### CORN

#### CHINCH BUG (Blissus leucopterus Say)

South Carolina. F. Sherman and associates (July 22): There have been several local outbreaks of chinch bug on corn in the lower piedmont area, apparently correlated with early season drought.

Ohio. T. H. Parks (July 22): While almost annihilated by the low temperatures of last winter, chinch bugs have made a remarkable come-back in some counties, especially in the northeastern part of the State. This was on account of the extremely dry weather of May, June, and July. We have received isolated reports of migrating chinch bugs from 10 counties in northeastern Ohio and from 6 counties in other parts of the State.

Indiana. J. J. Davis (July 20): Chinch bug infestations have developed in many sections of the State, especially the western tier or two of counties from Lake County on the north to Greene County on the south. There is no general infestation, the outbreaks being scattered, but, with the ideal chinch bug conditions, we may anticipate a rather large second brood.

C. M. Packard (July 10): Limited migrations of chinch bugs from a few fields of small grain, mostly winter wheat, to corn have been in progress since about June 27 in several northwestern counties. In most cases damage is limited to the first few rows. Many bugs now maturing and flying.



- Illinois. W. P. Flint (July 20): The weather for the past month has been highly favorable to chinch bug development and these insects are causing trouble at scattered points throughout the central part of the State. They are largely local, no general area of destruction occurring.
- Michigan. R. Hutson (July 17): Chinch bugs are reported to be numerous in a few cornfields near Galien in Berrien County.
- Wisconsin. E. L. Chambers (July 20): With an almost total absence of green grass and with small grains harvested ahead of schedule already burned up by dry weather, chinch bugs appeared in epidemic numbers and moved into corn in Pierce, Pepin, Dunn, Rock, and Walworth Counties.
- Minnesota. A. G. Ruggles (July 22): In Wabasha and Goodhue Counties a few chinch bugs are showing up; however, they are not yet doing much damage and are only moderately abundant.
- Iowa. C. J. Drake (July 24): Chinch bugs are quite abundant throughout the southern half of Iowa, the intense heat not having reduced their numbers. Slight damage has been done in small grains and cornfields.
- Missouri. L. Haseman (July 24): In June, when the migration of chinch bugs occurred, most farmers succeeded in keeping them out of their corn and no serious complaints have been received.
- Kansas. H. R. Bryson (July 23): Chinch bugs are fairly plentiful at Manhattan, but are doing no damage. Some damage was reported in the southern part of the State by E. G. Kelly and R. H. Painter.
- Mississippi. D. W. Grimes (July 23): Severe damage occurred on corn at Belzoni, but the bugs were soon controlled by the general rains early in July.

HAIRY CHINCH BUG (Blissus hirtus Montd.)

- Connecticut. W. E. Britten (July 22): Specimens and injured grass have been received from lawns in Bristol and Westport.

CORN EAR WORM (Heliothis obsoleta Fab.)

- Indiana. E. V. Walter (July 20): Infestation of corn ear worm at Lafayette is very light. Two fifth-instar larvae found on July 8 pupated by July 13.
- J. J. Davis (July 20): Examined 12 ears of corn grown near Lafayette on July 17 and found 7 ears with small to full-grown worms.
- Iowa. E. V. Walter (July 3-5): Observations on sweet corn showed infestation ranging from 8 to 80 percent, consisting mostly of eggs from Hubbard northward and of larvae farther south to Farnington, where some were in the third instar.



Nebraska. M. H. Swenk (July 24): Pupae perished last winter. Only one report of injury has been received, that being from Lancaster County on June 29. The moths have been unusually uncommon at the light trap at Lincoln.

Kansas. H. R. Bryson (July 23): Corn ear worms were plentiful in early sweet corn. They are in the pupal stage and some moths have emerged.

Tennessee. G. M. Bentley (July 16): The corn ear worm was working on corn tassels on June 26 at Manchester, in Coffee County.

Alabama. J. M. Robinson (July 16): Corn ear worms are moderately abundant on corn in central Alabama.

Utah. G. F. Knowlton (July 6): The first moths were collected in light traps at Spanish Fork and Syracuse on the night of June 28-29.

Washington. R. S. Lehman (July 21): The corn ear worm appeared earlier than usual and is extensively damaging sweet corn.

**STALK BORER (Papaipema nebris nitela Guen.)**

New York. R. E. Horsey (June 26): The stalk borer was found in soft shoots of climbing roses and in catnip stalks nearby.

New Jersey. E. Kostal (July 7): The stalk borer is abundant and destructive at Morganville. Hosts attacked include sweet corn, zinnia, sunflower, cosmos, tomato, and strawberry, the latter being attacked in the leaf petioles.

Minnesota. A. G. Ruggles (July 22): P. nitela is damaging corn in Le Sueur County.

Nebraska. M. H. Swenk (June 24): The common stalk borer was reported to have taken about 40 rows in a field of corn in Cuming County.

**LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)**

Georgia. T. L. Bissell (July 14): Caterpillars are injurious to late beans and cowpeas at Experiment.

Tennessee. G. M. Bentley (June 27): The lesser cornstalk borer was found damaging corn in Franklin County.

**CORN ROOT WEBWORM (Crambus caliginosellus Clem.)**

Tennessee. G. M. Bentley (July 16): The bud worm (C. caliginosellus) was reported on corn on June 27 in Polk, Benton, and Unicoi Counties.

CARROT BEETLE (Ligyrus gibbosus Deg.)

Tennessee. G. M. Bentley (July 16): The carrot beetle was reported damaging corn in Hickman County on June 29.

Minnesota. A. G. Ruggles (July 22): L. gibbosus is attacking coreopsis and gaillardia in Hennepin County and carrots and lettuce in Stearns County.

CORN LEAF APHID (Aphis maidis Fitch)

Mississippi. C. Lyle (July 23): A very heavy infestation on corn and sorghum was found at Houston on July 13.

ALFALFA

ALFALFA WEEVIL (Hypera postica Gyll.)

South Dakota. J. C. Hamlin (June): Larvae collected in Fall River County. (Det. by A. G. Boving.)

Nebraska. J. C. Hamlin (June): Adults from western Nebraska (Det. by L. L. Buchanan); also larvae from Dawes County. (Det. by A. G. Boving.)

Colorado. J. C. Hamlin (June): Larvae collected in Eagle County. (Det. by A. G. Boving.)

California. A. E. Michelbacher (July 21): The highest larval count for the alfalfa weevil encountered per 100 sweeps of an insect net in the San Joaquin Valley on July 17 was 103, while 92 was the highest average number collected in the San Francisco Bay area on July 20.

PLANT BUGS (Lygus spp.)

Utah. C. J. Sorenson (July 22): L. elisus Van D. and L. elisus hesperus Knight are very abundant throughout the entire State, particularly in alfalfa-seed fields.

VETCH

VETCH BRUCHID (Bruchus brachialis Fahraeus)

North Carolina. J. S. Pinckney (July 18): The vetch bruchid is heavily infesting vetch seed in North Carolina in the following counties: Alexander, Anson, Catawba, Cabarrus, Davidson, Davie, Forsyth, Gaston, Guilford, Iredell, Lincoln, Mecklenburg, Montgomery, Randolph, Rowan, Richmond, Stanly, Union, and Yadkin. The records of infestation in Alexander, Anson, Montgomery, and Richmond are new areas of infestation. Infestation in all fields ran at least 50 percent, with maxima as high as 90 percent.

GRASS

FALL ARMYWORM (Laphygma frugiperda S. & A.)

North Carolina. C. H. Brannon (July 28): Infestations in Duplin, Pasquotank, Sampson, Wake, and Wayne Counties are numerous and severe damage is being done to grasses and corn.

Florida. J. R. Watson (July 20): Specimens of the fall armyworm have been received from several parts of the State.

Puerto Rico. G. N. Wolcott (July 13): An outbreak of caterpillars on malc-jillo and other grasses, and, to a lesser extent, on young sugarcane, has been noted around Rio Piedras, extending at least as far east as the Trujillo Alto Road, and as far west as Toa Baja. Such outbreaks are expected during the wet winter months, and it is somewhat surprising to have one occur in midsummer. This may possibly be due to the exceptionally heavy rains of the past 2 months. The last-instar caterpillars are not the typical gray color, but more yellow or greenish, in some case with contrasting black markings.

F R U I T I N S E C T S

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

New York. D. W. Hamilton (July): From July 6 to 16 new larval entrances at Poughkeepsie were more numerous than at any previous time this season. In poorly sprayed orchards entrances are unusually numerous. Practically all spring-brood moth activity had ceased by July 8. Although first-brood adults began emerging as early as July 10, the light- and bait-trap captures still indicate a light flight in the orchards. Comparatively heavy second-brood injury is anticipated.

Delaware. L. A. Stearns (July 24): The peak of codling moth activity occurred on the nights of July 8 and 9. Early hatched second-brood larvae were entering fruit in considerable numbers during the week of July 12-18.

Ohio. T. H. Parks (July): Second-brood emergence started at Wooster on July 10, in Ottawa County on July 15, and near Cleveland on July 18. The bait pans have caught moths at Columbus almost continuously since May 16. Largest numbers of first-brood moths were caught between May 21 and June 6. Heavy catches have occurred since July 14 and are still in progress. We look for a heavy second brood. From 50- to 60-percent entrances are common on some unsprayed trees.

Indiana. L. F. Steiner (July 23): At Vincennes the same bait traps that in May and June caught 1,300 moths have captured approximately 2,000 since June 30, and at Bicknell (17 miles northeast) 11,500 have been caught during July in traps that captured only 5,500 spring-brood moths. At



Vincennes the peak activity occurred on the nights of July 5, 7, and 11, and at Bicknell moths were most abundant on July 10 and 13, almost a month earlier than in 1935. There is evidence that the sustained high temperatures, which exceeded 100° F. for a total of 25 hours from July 11 to 14 with maximums of 110° to 111°, caused considerable mortality among moths at Vincennes. This is the first season in several years that first-brood adults were more abundant than those of the spring brood. The percentage of fruit already wormy is greater than ever before observed in numerous orchards in this region, and a heavy third-brood attack is still in prospect.

Illinois. W. P. Flint (July 20): Owing to unusually favorable weather conditions, injury has increased and the infestation in southern Illinois is fully as heavy as it was in 1934. Even in orchards where five first-brood cover sprays were applied, damage is rather heavy.

Michigan. R. Hutson (July 17): The emergence of second-brood moths was reported on July 15 from our stations at Buchanan, Eau Claire, Hartford, Albion, and Lawton.

Missouri. L. Haseman (July 24): The second-brood moths in southwestern Missouri began emerging around June 20, reaching a peak the last 2 or 3 days in June, then letting up for a few days because of heavy rains, and again reaching a lower peak around the 10th and 11th of July. In central Missouri emergence began the last of June, reaching a preliminary peak on the 28th and 29th, followed by a lull and another peak between the 9th and 11th of July. In northwestern Missouri slow emergence began the last of June, reaching a peak on July 4 to 6, and continuing high until the 15th. As in 1934, the excessive high temperatures during the first 3 weeks in July have practically stopped second-brood egg laying and hatching, for very few second-brood worms have shown up in southwestern Missouri, practically none in central Missouri, and numbers are below normal in most orchards in northern Missouri.

Washington. E. J. Newcomer (July 27): Adults of first-brood moths began appearing in baits at Yakima on July 12 and were abundant by July 18. Second-brood larvae were hatching by July 20.

Oregon. B. G. Thompson (July): Second-brood moths (first generation) emerged on July 17. Second-generation eggs were laid on July 20.

California. S. Lockwood (July 20): Codling moths are not so prevalent on the Sacramento River as at this time last year. In Lake County moths are flying in considerable numbers for that section.

#### APPLE MAGGOT (Rhagoletis pomonella Walsh)

New York. N. Y. State Coll. Agr. News Letter (July 6): In the Hudson Valley apple maggot flies are emerging in large numbers and a general upward trend for the daily fly catches is evident. The ratio of females to males is about 2½ to 1. Normally, this would indicate that the peak of emergence is still a few days away. (July 20): Apple maggots are found

in some orchards in Suffolk County.

New Jersey. E. Kostal (July 7): Flies were first seen on apple trees at Morganville, Monmouth County, on June 26.

Ohio. T. H. Parks (July 22): Flies failed to emerge this year in a trap set for that purpose, and have not been seen on apple foliage. Indications point to this insect's being very scarce in northeastern Ohio, where it is usually troublesome.

Wisconsin. C. L. Fluke (July 21): First fly emerged in Crawford County on June 17, the same date as in 1935.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (July 22): Very general outbreak of European red mite in many parts of the State. Enemies are scarce in most orchards.

Ohio. T. H. Parks (July 22): The European red mite has been reported to be very abundant in some orchards of northern Ohio.

PEACH

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Connecticut. P. Garman (July 22): Apparently the plum curculio is more abundant in New Haven County on apples than it was a year ago. Not serious in sprayed orchards.

Delaware. L. A. Stearns (July 24): The peak of abundance of first-brood adults at Bridgeville occurred on July 2.

New Jersey. M. Kisliuk, Jr. (June 26): Nine larvae taken out of the fruit of Black Oxheart cherry at Bergenfield, Bergen County, on June 20. (Det. by A. G. Boving.)

South Carolina. F. Sherman and associates (July 22): Peach and plum curculio is apparently below normal. Unsprayed trees under observation have matured more worm-free fruits than usual.

Georgia. O. I. Snapp (July 6): Second-generation larvae are now appearing in Elbertas at Fort Valley, the last commercial variety of peach to ripen in the Georgia peach belt. Although the second-brood attack is not heavy, a number of reports of damage have been received. This second generation was produced under drought. (July 20): The harvest of the cleanest peach crop in 10 or 15 years has just been completed at Fort Valley. Although second-brood larvae attacked the Elbertas, the infestation was not heavy and little damage was done.

Alabama. J. M. Robinson (July 16): The peach curculio is very abundant in central Alabama.



ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (July 22): Second-generation tip infestation showing up conspicuously in some orchards. The northern portions of the State generally are free.

Delaware. L. A. Stearns (July 24): Although parasitization of first-brood twig-infesting larvae was subnormal, a decided increase has been recorded in the case of the second brood.

South Carolina. F. Sherman and associates (July 22): Injury is decidedly below normal.

Georgia. O. I. Snapp (July 20): The infestation in yard trees and home orchards at Fort Valley continues lighter than usual. The insect has done no damage whatever in the commercial peach orchards of this locality.

Illinois. W. P. Flint (July 20): Has been very abundant in the southern part of the State, particularly in the section where we have a peach crop.

TARNISHED PLANT BUG (Lygus pratensis L.)

Vermont. H. L. Bailey (July 23): The tarnished plant bug is unusually abundant, particularly on potato plants throughout the State. Many small leaves and branchlets have been killed back.

Michigan. R. Hutson (July 17): Tarnished plant bug has been reported damaging peaches at Fennville, St. Joseph, Sodus, Albion, Jackson, Howell, and Pontiac.

Tennessee. G. M. Bentley (July 16): On July 13 tarnished plant bug was found on peach in a nursery at Knoxville. The injury is causing a setback to young peach trees. Observed by C. B. Shankle, inspector.

PEAR

PEAR PSYLLA (Psyllia pyricola Foerst.)

New York. N. Y. State Coll. Agr. News Letter (July): The pear psylla continues to be a serious problem for pear growers in the Hudson Valley. The insect is also doing considerable damage in western New York.

CHERRY

CHERRY FRUIT FLY (Rhagoletis cingulata Loew)

Oregon. S. C. Jones (July): Emergence of R. cingulata occurred in Willamette Valley on June 1. Oviposition occurred on June 17 and hatching on the 23rd. Maggots were full grown on July 7.



BLACK CHERRY APHID (Myzus cerasi Fab.)

New York. N. Y. State Coll. Agr. News Letter (July 13): A heavy infestation of black cherry aphid was noted in one block of sour cherries in Monroe County.

CHERRY FRUIT WORM (Grapholitha packardii Zell.)

Washington. E. J. Newcomer (July 27): The infestation of cherry fruit worm in the vicinity of Seattle and Tacoma is about the same as in 1935.

RASPBERRY

RASPBERRY SAWFLY (Monophadnoides rubi Harr.)

Ohio. E. W. Mendenhall (July 15): The raspberry sawfly caused serious damage to red raspberry patches near Dayton, Montgomery County.

Idaho. C. Wakeland (July 22): The raspberry sawfly was discovered in Fremont County in June, the first record of its occurrence in Idaho.

RASPBERRY FRUIT WORM (Byturus unicolor Say)

Ohio. E. W. Mendenhall (July 1): The raspberry byturus was found in a number of red raspberry plantations in central Ohio. It is claimed that usually it is found in northern Ohio in the red varieties.

GRAPE

GRAPE LEAFHOPPER (Erythroneura comes Say)

New York. N. Y. State Coll. Agr. News Letter (July 20): Nymphs are becoming very numerous in some vineyards in Wayne County.

Delaware. L. A. Stearns (July 24): Infestation over the entire State is light. Special spray for control of this pest applied in but a few vineyards.

South Carolina. F. Sherman and associates (July 22): Grape leafhopper is now prevalent in the college vineyard at Clemson College.

Michigan. R. Hutson (July 17): Eggs were deposited in numbers from June 4 to 15. Nymphs began to appear at Hartford, Paw Paw, and Coloma on June 15, with a peak hatch from June 24 to 30.

Nebraska. M. H. Swenk (July 24): On June 25 a Pawnee County correspondent reported the grape leafhopper attacking woodbine and the pest was reported damaging grapevines in Franklin County on July 10.

Utah. G. F. Knowlton (July 23): Injury to grapes and Virginia creepers is becoming more serious and general throughout northern Utah. Serious injury is now apparent in many localities.

California. C. S. Morley (July 6): Considerable spraying for the control of the grape leafhopper has been done in the northern part of Kern County.

GRAPE TOMATO GALL (Lasiapteryx vitis O. S.)

Michigan. R. Hutson (July 17): The grape tomato gall was reported from Cass City, where it was quite numerous.

CRANBERRY

BLUNT-NOSED LEAFHOPPER (Euscelis striatulus Fall.)

Wisconsin. E. L. Chambers (July 20): The blunt-nosed leafhopper, believed to be the only important carrier of the virus disease of cranberries (false blossom), was unusually abundant in the central part of the State and aeroplane dusting of several large bogs was carried on recently.

PECAN AND WALNUT

PECAN NUT CASE BEARER (Acrobasis caryae Grote)

Texas. C. B. Nickels (July 20): In southern Texas first-generation larvae destroyed from one-third to two-thirds of the total crop of pecans, and in central and western Texas from one-fourth to one-half of the crop.

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Nebraska. M. H. Swenk (July 24): A Douglas County correspondent reported on June 24 that the walnut caterpillar was attacking his walnut trees.

Kansas. H. R. Bryson (July 23): Reports received of the walnut datana on black walnut.

Oklahoma. F. A. Fenton (July 13): There is quite a severe defoliation of pecan and walnut trees in Oklahoma by the walnut datana. Last year the second brood of this species practically stripped the pecan trees late in the season. (July 20): The first brood of the walnut datana has completed the larval stage and the larvae are now in the soil as pupae. Widespread defoliation of walnuts and pecans throughout the State has occurred.

Texas. C. B. Nickels (July 20): In southern, central, and western Texas damage to pecan by the walnut caterpillar in May and June was extensive but irregular. Some trees were nearly completely defoliated, while other nearby trees suffered slight or no injury. Defoliated trees will be unable to mature a crop this season or set many nuts next year.

CITRUS

CALIFORNIA RED SCALE (Chrysomphalus aurantii Mask.)

Arizona. C. D. Lebert (June 24): Infestation of three citrus trees was found

in the northern Phoenix area. These and the surrounding trees were sprayed. Ten days later the entire bloc (20 trees) was fumigated. The same treatment was given to a row of oleanders in the city of Phoenix.

CITRUS MEALYBUG (Pseudococcus citri Risso)

Florida. J. R. Watson (July 20): Mealybugs have been unusually active in the citrus belt.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (July 20): The latter half of June and the first half of July was relatively dry in the citrus belt of Florida, with the result that rust mite persisted in considerable numbers.

CITRUS RED MITE (Paratetranychus citri McG.)

California. H. J. Ryan (July 20): A number of citrus orchards in Los Angeles County have considerable infestations of citrus mite, notwithstanding the warm weather that prevailed for several days prior to this time, and some control measures will have to be taken.

FIG

MEXICAN MEALYBUG (Phenacoccus gossypii T. & C.)

Florida. E.W. Berger and G. B. Merrill (July 21): The cotton mealybug is very abundant on a tree of edible figs in a yard at Pensacola.

T R U C K - C R O P I N S E C T S

BLISTER BEETLES (Meloidae)

Maryland. E. N. Cory (July 16): Three species of blister beetles, Epicauta cinerea Forst., E. cinerea marginata Fab., and E. pennsylvanica Deg., have been found infesting dahlias at Centerville.

Indiana. J. J. Davis (July 20): Blister beetles, E. cinerea marginata, E. pennsylvanica, and E. vittata Fab., have been abundant in gardens in central Indiana, attacking potatoes, swiss chard, beets, and other garden crops.

Kentucky. W. A. Price (July 25): Blister beetles are abundant in the blue-grass district.

Minnesota. A. G. Ruggles (July 22): Lytta nuttalli Say is damaging beans in Hubbard County.

Iowa. C. J. Drake (July 24): Blister beetles are unusually abundant throughout the entire area infested with grasshoppers. E. pennsylvanica, E. cinerea, and E. vittata seem to be the most common species.



North Dakota. F. Gray Butcher (July 21): Blister beetles have become very abundant, especially in the southwestern part of the State. Several potato fields have been entirely destroyed, and gardens and shrubs have been seriously damaged. E. maculata Say and Macrobasis unicolor Kby. predominate, but E. pennsylvanica and L. nuttalli are also present.

South Dakota. H. C. Severin (July 17): Blister-beetle damage is continuing to be very severe. Injury is occurring in all sections of the State.

Nebraska. M. H. Swenk (July 24): Many species of blister beetles have been very numerous and injurious, working especially on potatoes and tomatoes, as well as on other garden crops.

Kansas. H. R. Bryson (July 23): Blister beetles (Epicauta sp.) are very abundant in the State this year. On account of the scarcity of weeds and green vegetation in some localities, this pest has concentrated on tomatoes and other garden crops. In some gardens beet tops have been stripped.

Oklahoma. C. F. Stiles (July 25): Several species of blister beetles have been reported generally throughout the State. They are doing some damage to alfalfa fields and garden and truck crops. On the courthouse yard at Beaver they are defoliating the Chinese elms.

Mississippi. C. Lyle (July 23): The blister beetle E. lemniscata Fab. was reported causing damage to cotton at Florence on July 5 and serious injury to tomatoes, eggplants, peppers, and flowers at Carriere on July 8.

#### WESTERN SPOTTED CUCUMBER BEETLE (Diabrotica soror Lec.)

Oregon. D. C. Mote (July): D. soror is more numerous and is doing more damage in the Willamette Valley than it has for the past 5 years. Considerable damage has been done this year by larvae on corn and cucurbit roots. Reported by B. F. Thompson.

#### FALSE CHINCH BUG (Nysius ericae Schill.)

Michigan. R. Hutson (July 17): The false chinch bug has been reported as injuring berries at Fennville, Greenville, and St. Joseph.

Minnesota. A. G. Ruggles (July 22): Reported from Big Stone County as very abundant and doing some damage to corn.

North Dakota. F. Gray Butcher (July 21): False chinch bugs have become very abundant over a wide area of the State, feeding on garden crops, cereals, raspberries, and other plants.

South Dakota. H. C. Severin (July 18): We are having the worst outbreak we have ever had. Damage to garden truck, alfalfa, flax, and small fruits is continuing at the present time. The raspberry crop is ruined over much of the State.

Nebraska. M. H. Swenk (July 24): From Knox, Custer, and Holt Counties early in July, came complaints of the false chinch bug infesting gardens.

Kansas. H. R. Bryson (July 23): False chinch bug very abundant in some localities. Reported as very abundant on cantaloupe vines at Manhattan.

PALE-STRIPED FLEA BEETLE (Systema blanda Melsh.)

Michigan. R. Hutson (July 17): Pale-striped flea beetle is numerous at Lowell on beans and at Ovid on mint.

WESTERN CABBAGE FLEA BEETLE (Phyllotreta pusilla Horn)

Nebraska. M. H. Swenk (July 24): The western cabbage flea beetle was especially injurious to crucifers during the period from June 21 to July 20, throughout the State.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

New York. N. Y. State Coll. Agr. News Letter (July 6): Adult beetles are abundant on late upland potatoes that are just nicely up in Cayuga County.

Ohio. B. J. Landis (July 2): First-brood larvae, which were very abundant at Columbus late in June, are now scarce. New beetles are very numerous and have migrated to eggplant, Solanum dulcamara, bull thistle, tomato, tobacco, wild groundcherry, and petunia. (July 16): Egg masses are now present on late potato and a few larvae are found on S. dulcamara and bull thistle. The tachinid parasite Doryphorophaga doryphorae Riley was not so numerous in first-brood larvae as in 1935, the average parasitization being 23 percent.

Wisconsin. E. L. Chambers (July 20): The Colorado potato beetle, almost scarce for the past 5 years, has returned as a major pest throughout Wisconsin this summer.

Minnesota. A. G. Ruggles and assistants (July): Colorado potato beetle observed in great abundance in many places scattered throughout the State.

Utah. G. F. Knowlton (July 13): About 150 acres will be sprayed for the Colorado potato beetle in Ogden and Roy, in Weber County, and Sunset, in Davis County, including all farms within the limits of the infested area although on many of them no beetles have been found.

C. J. Sorenson (July 22): A few Colorado potato beetles have been found near Clinton, in Davis and Weber Counties.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

Wisconsin. C. L. Fluke (July 21): Potato flea beetles are unusually abundant in southern Wisconsin, causing damage to tomatoes and potatoes.



Tennessee. G. M. Bentley (July 16): The flea beetle was reported on June 27 on potatoes in Unicoi County.

Colorado. G. M. List (July 23): The potato flea beetle has been very abundant in many localities of the State. Much injury has been done to garden crops and to some field crops.

Washington. I. W. Bales (July 20): Potato flea beetles (E. cucumeris) were collected in Kittitas County, near Cle Elum, on July 7. This insect caused considerable injury to the potatoes in that vicinity last season, as well as in Yakima County.

R. S. Lehman (July 21): The western potato flea beetle (E. subscrinita Lec.) reported earlier in the season as injurious to tomato plants, still persists on the foliage of tomato, eggplant, and potato. It is unusual for the flea beetle to persist so late in the season.

#### POTATO LEAFHOPPER (Empoasca fabae Harr.)

Connecticut. N. Turner (July 22): Heavy infestation of the potato leafhopper on dahlias at Mt. Carmel with much dwarfing, tipburn, and leaf curl.

New York. N. Y. State Coll. Agr. News Letter (July 6): Leafhoppers are very numerous on potatoes in Cayuga County, causing many tips to wilt.

Michigan. R. Hutson (July 17): Potato leafhopper appeared on alfalfa and potatoes at East Lansing about July 1.

Minnesota. A. G. Ruggles and assistants (July): Potato leafhopper observed as very abundant in several localities.

South Dakota. H. C. Severin (July 18): Potato leafhopper is very serious this year on potato and caragana generally over the State.

#### A LEAFHOPPER (Empoasca filamenta DeLong)

Idaho. C. Wakeland (July 22): E. filamenta is causing noticeable injury to potato vines in Bonneville County.

#### CORN EAR WORM (Heliothis obsoleta Fab.)

South Carolina. F. Sherman and associates (July 22): Prevalence of the tomato fruit worm in tomato fruits is normal or slightly below.

Ohio. H. C. Mason (July 23): At South Point the tomato fruitworm is less abundant than for the last 2 years.

Kentucky. W. A. Price (July 25): Corn ear worms are causing a great deal of damage to tomatoes. Practically 100 percent of the ears of sweet corn are infested.

Mississippi. C. Lyle and assistants (July 23): The corn ear worm has been



reported as especially injurious in Jackson and Harrison Counties during July. It was reported as doing severe damage to tomatoes in several fields at Grenada.

Utah. G. F. Knowlton (July 6): Corn ear worms are damaging early sweet corn at Bountiful. The first worm was found attacking tomatoes today at Willard. Moths were taken in light traps at Spanish Fork and Syracuse on the night of June 28.

California. A. E. Michelbacher (July 21): An examination of the tomato fields about Visalia, Tulare County, on July 16 showed that the amount of fruit infested ranged from about 1 to 6 percent. Adults of H. phloxiphaga G. & R. have been common in tomato fields for a number of weeks.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. A. E. Michelbacher (July 21): Larvae of the tomato pinworm were found in tomato fields about Visalia on July 16. About 5 percent of the fruit was infested in two fields.

Pennsylvania. C. A. Thomas (July 17): On account of strenuous clean-up measures, and especially owing to crop rotation which omitted the fall tomato crop in most Chester County greenhouses, the tomato pinworm has become very much reduced in numbers, being found at the present date, July 7, only in two greenhouses in the Kennett Square area. It has also been practically cleaned up in the New Castle area.

California. J. C. Elmore (July 8): An examination of 50 ripe fruits in three tomato fields in Orange County showed that 20, 30, and 54 percent of them were infested.

TOMATO WORM (Phlegethontius sexta Johan.)

Ohio. B. J. Landis (July 10): At Columbus tomato hornworm larvae are quite numerous on late potatoes.

Kansas. H. R. Bryson (July 23): Tomato hornworms are quite abundant. Tomatoes have been seriously injured by the drought, which accentuates the injury by the pests.

California. J. C. Elmore (July 17): Eighty tomato hornworms per acre were observed in experimental tomato plots at Irvine. Serious damage to tomatoes was reported in this same locality last year.

TOMATO PSYLLID (Paratrioza cockerelli Sulz.)

Colorado. G. M. List (July 23): The tomato psyllid is only moderately abundant. It did not make its usual increase in numbers in the Fort Collins section during the past month. A few plantings are showing indications of yellows.

Wyoming. M. Greenwald (July 11): Psyllids first noticed on potatoes and tomatoes in Park County at Powell on July 10. A little leaf curl is beginning to show on tomato. No symptoms of purple top to be seen in potato fields.

POTATO APHID (Illinoia solanifolii Ashm.)

Connecticut. N. Turner (July 17): Several small fields of Irish Cobbler potatoes in Connecticut Valley have been killed by this aphid. Some infestation on late potatoes and many growers have found it necessary to apply special sprays. Tomato plants in Guilford and West Haven are heavily infested.

New York. N. Y. State Coll. Agr. News Letter (July 20): Aphids were present on potatoes in large numbers last week, but seem to be disappearing now on Long Island.

New Jersey. T. L. Guyton (July): Potato aphid observed on tomatoes and potatoes and was very numerous at Bound Brook on July 6, and at Clayton, Bridgeton, and Millville on the 9th.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Connecticut. N. Turner (July 23): Beans not treated with insecticides have been defoliated in many places by the Mexican bean beetle, which is about as abundant as last year.

New Jersey. E. Kostal (July 7): The Mexican bean beetle has been practically eliminated in some garden patches by persistent dusting and spraying. Noted at Morganville, in Monmouth County, on July 7.

Delaware. L. A. Stearns (July 24): Infestation of Mexican bean beetle is generally much lighter than usual over the entire State.

North Carolina. C. H. Brannon (July 25): The Mexican bean beetle is seriously damaging beans throughout the State.

South Carolina. F. Sherman and associates (July 22): The Mexican bean beetle was late in spring emergence, slow in increasing, and is still decidedly below normal.

Georgia. T. L. Bissell (July 15): Many complaints of damage to snap beans in central Georgia.

Ohio. T. H. Parks (July 22): This insect has made a rapid come-back from the few beetles which survived the winter, but the infestation at Columbus and in northern Ohio is still somewhat below average.

N. F. Howard (July 20): The Mexican bean beetle is less numerous at Columbus and South Point than for several years. Severe drought and high temperatures have been unfavorable for beans as well as beetles.

Indiana. J. J. Davis (July 20): Mexican bean beetle showed signs of becoming extremely abundant but the intense heat has caused a very high mortality. G. E. Gould has observed large numbers of larvae and pupae turning brown and dying from the heat, and pupae are having difficulty in completing their transformations.

Michigan. R. Hutson (July 17): Mexican bean beetles are feeding on a field of bindweed at East Lansing and on beans at South Haven.

Tennessee. G. M. Bentley (July 16): Reported on June 29 as doing damage in Robertson, McNairy, and Wayne Counties.

Alabama. J. M. Robinson (July 16): During the drought period the larvae have not developed. The adults have lived through the drought and since recent rains inquiries for control measures have been coming in from the central and northern parts of the State.

Mississippi. C. Lyle and assistants (July 23): The Mexican bean beetle was collected at Meridian on June 24. This is the first record in Lauderdale County. A complaint of injury on beans at Houlka, in Chickasaw County, was received on June 30. The drought during June caused this pest to be scarce in northeastern Mississippi.

Colorado. G. M. List (July 23): The Mexican bean beetle is very abundant in northern Colorado. The overwintering adults appeared in plantings in the Fort Collins district, as many as two adults to each foot of row. Untreated plantings are largely defoliated.

#### PEAS

##### PEA APHID (*Illinoia pisi* Kalt.)

Georgia. O. I. Snapp (July 21): J. R. Thomson, Jr., reports an unusually heavy infestation of aphids on field peas in gardens at Fort Valley.

Iowa. C. J. Drake (July 24): The pea aphid has been reported as doing a considerable amount of damage in alfalfa and clover fields in the vicinity of Cedar Rapids and Waterloo. Some damage has also been done to cultivated peas.

Utah. G. F. Knowlton (July 11): Serious losses in yield and quality in peas from pea aphid have resulted throughout northern Utah, with scattered fields not being worth cutting.

Oregon. K. W. Gray (July): The pea aphid was first noticed at Astoria on May 21 and peas are now heavily infested.



LIMA BEAN POD BORER (Etiella zinckenella Treit.)

Oregon. D. C. Mote (July): Ninety percent of the pods of Lathyrus (beach pea) at Sunset Beach are infested with lima bean pod borer.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Ohio. T. H. Parks (July 22): The imported cabbage worm is present on cabbage in normal numbers and indications point to a heavy outbreak in the late cabbage.

Minnesota. A. G. Ruggles (July 22): Imported cabbage worm is very abundant.

South Dakota. H. C. Severin (July 18): Cabbage worm is very abundant.

Nebraska. M. H. Swenk (July 24): A Blaine County correspondent complained of cabbage worms on June 30.

Colorado. G. M. List (July 24): The imported cabbage worm is very abundant in cauliflower and cabbage plantings in central and northern Colorado.

CABBAGE APHID (Brevicoryne brassicae L.)

Tennessee. G. M. Bentley (July 16): This pest is unusually prevalent in Benton, Franklin, and Jefferson Counties.

Iowa. C. J. Drake (July 24): Cabbage aphids have been reported as doing considerable damage to cabbage in the vicinity of Cedar Rapids. Some plantings have been badly injured.

ONION THRIPS (Thrips tabaci Lind.)

Virginia. W. J. Schoene (June 26): There is a very heavy infestation of nymphs of thrips on cabbage in the cabbage-growing district and the injury is quite severe and widespread. (Identified by J. C. Crawford.)

A WEEVIL (Ceutorhynchus assimilis Payk.)

Washington. I. W. Bales (July 20): Turnip seed weevils were collected on cabbage plants on June 24 in Island County, near Coupeville. This insect is also well established in Skagit County.

Oregon. K. E. Gray (July): C. assimilis is very injurious on mustard and cabbage seed in the Willamette Valley and at Scappoose, Columbia County. Fifty percent of the crop is attacked.

MELONS

MELON APHID (Aphis gossypii Glov.)

North Carolina. C. H. Brannon (July 10): This aphid is seriously damaging watermelon and cantaloup in Scotland County.

South Dakota. H. C. Severin (July 18): The melon aphid is just starting on melons and cucumbers in eastern South Dakota.

Missouri. L. Haseman (July 24): Since the middle of July there has been an unusually heavy outbreak on melons in southwestern Missouri. Notwithstanding the abundance of ladybeetles, syrphid flies, and hymenopterous parasites, the aphid has seemingly been able to do more damage during July than we have ever before known it to do.

Arkansas. D. Isely (July 23): There has been a rather severe outbreak on cantaloups in the southwestern Arkansas cantaloup belt.

Nebraska. M. H. Swenk (July 24): Melon aphid was reported attacking cucumber plants in Pierce County on July 1.

Kansas. H. R. Bryson (July 23): The infestation at Manhattan has increased rapidly during the past week. If the hot, dry weather continues, all melons and cucumbers will suffer.

Oklahoma. F. A. Fenton (July 20): Melon aphid is causing serious injury to melons and cucurbits.

Mississippi. C. Lyle (July 23): Caused a great deal of damage to water-melons in the vicinity of Holly Springs.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Maryland. G. Myers (July 24): The squash bug is very abundant on squash in my garden on Avery Road about  $2\frac{1}{2}$  miles east of Rockville. Almost every plant of the winter Hubbard squash has been killed, but the summer Crookneck seems to be less attractive to the insect and has not been seriously damaged.

Indiana. J. J. Davis (July 20): Squash bug was reported as abundant at Roachdale, in Putnam County, on July 3.

South Dakota. H. C. Severin (July 18): Squash bug is more abundant than usual on cucumbers and melons in eastern South Dakota.

Missouri. L. Haseman (July 24): During the month there has been a marked pick-up in the abundance of squash bugs and a good many complaints from growers have reached this office.

Nebraska. M. H. Swenk (July 24): The squash bug was reported to be damaging squashes in Lancaster, Douglas, and Scotts Bluff Counties.

Oklahoma. F. A. Fenton (July 20): The squash bug is causing injury to squashes.

Colorado. G. M. List (July 23): Unusually abundant this season. Many plantings have been destroyed. During one afternoon the bugs were observed to be resting on 27 out of 50 label stakes in an experimental plot of tomatoes, adjoining a small planting of squash, but no squash was growing in the same field.

#### EGGPLANT

##### EGGPLANT TORTOISE BEETLE (Gratiana pallidula Boh.)

District of Columbia. W. H. White (June): Specimens were brought to this office with a report that the insect was injuring eggplant in a garden at Takoma Park, Washington, D. C. (Det. by H. S. Barber.)

Ohio. B. J. Landis (July 20): Larvae, pupae, and adults were present on eggplant at South Point and feeding holes were apparent.

##### EGGPLANT LACEBUG (Gargaphia solanii Heid.)

Mississippi. C. Lyle and assistants (July 23): Lacebugs were injuring eggplants at Aberdeen and Cleveland.

#### ASPARAGUS

##### ASPARAGUS BEETLE (Crioceris asparagi L.)

Washington. E. W. Jones (July 15): Adults, eggs, and larvae of the second brood of asparagus beetles have been observed at Walla Walla. Damage to young asparagus plants is very apparent and beetles were found on nearly every plant. The second brood of beetles are much more numerous than the first brood, which were present in the field on April 16.

#### ONIONS

##### ONION THRIPS (Thrips tabaci Lind.)

Indiana. J. J. Davis (July 20): Onion thrips reported as damaging onion at Ligonier on June 16.

Washington. K. E. Gibson (July 21): On June 17 a report of insect injury to summer onions at Walla Walla was received and traced to a heavy infestation of the onion thrips. Since that time numerous reports of thrip injury to summer onions have been received. The presence of the thrips is not unusual, but ordinarily they do not make an appearance until onion bulbs have their growth. This season they appeared so early that the onion tops were damaged and the bulbs consequently stunted.



MINT

MINT FLEA BEETLE (Longitarsus waterhousei Kutsch.)

Oregon. D. C. Mote (July): Mint flea beetle not heretofore taken in Oregon. It was found doing severe damage to a 17-acre field of mint in Marion County.

ARTICHOKE

ARTICHOKE PLUME MOTH (Platyptilia carduidactyla Riley)

California. W. H. Lange (July 2): The University of California is conducting a study on the artichoke plume moth, which takes a loss of approximately 30 percent of the crop. The seriousness of the pest initiated the artichoke growers in San Mateo, Santa Cruz, and Monterey Counties to hold a meeting with the College of Agriculture, at which time the present project was started. Artichokes are also raised in Marin and San Luis Obispo Counties.

STRAWBERRY

STRAWBERRY LEAFROLLER (Ancylis comptana Froel.)

Ohio. T. H. Parks (July 22): This insect caused heavy damage to strawberry plantings near Dayton, Montgomery County, which is the only place in Ohio where the insect is serious.

Nebraska. M. H. Swenk (July 24): A strawberry patch in Howard County was reported on June 20 to be infested with the strawberry leaf roller.

Utah. G. F. Knowlton (July 12): Strawberry leaf roller moths are abundant and young worms are becoming numerous in strawberry patches in Utah County.

PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

Florida. J. R. Watson (July 20): A light infestation of the pepper weevil has been discovered in Manatee County, but only a fraction of 1 percent of last year's infestation at this time.

PEPPER MAGGOT (Zonosemata electa Say)

Connecticut. W. E. Britton (July 22): Z. electa collected on pepper at Hamden.

RHUBARB

RHUBARB CURCULIO (Lixus concavus Say)

Delaware. L. A. Stearns (June 22): Adults of the rhubarb curculio reported on rhubarb and specimens submitted for identification from Smyrna.

TOBACCO

TOBACCO WORMS (Phlegethontius spp.)

North Carolina. C. H. Brannon (July 25): The tobacco hornworm (P. quinquemaculata Haw.) has caused widespread damage to tobacco this year.

Tennessee. G. M. Bentley (July 16): The tomato worm (P. sexta Jchan.) and the tobacco worm (P. quinquemaculata) were reported on tobacco in Unicoi County on June 27.

TOBACCO BUDWORM (Heliothis virescens Fab.)

North Carolina. C. H. Brannon (July 25): Damage by the budworm is spotted, some sections reporting heavy damage and other sections a light infestation.

TOBACCO FLEA BEETLE (Epitrix parvula Fab.)

North Carolina. C. H. Brannon (July 25): Damage by flea beetles has been serious in many sections.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

Tennessee. G. M. Bentley (July 16): A limited attack on cotton in Wayne County was reported on June 30.

South Carolina. F. Sherman and associates (July 22): The cotton boll weevil is less prevalent than usual, and especially so in the upper Piedmont area--this following an unusually cold winter, low spring emergence, and severe early drought.

Alabama. J. M. Robinson (July 16): Boll weevil infestation at Auburn is light.

Mississippi. C. Lyle (July 23): Infestation throughout the month has continued to be low. In the southern part of the State cotton has about stopped fruiting and picking will begin in the older cotton in about 2 weeks.

Oklahoma. F. A. Fenton (July 20): Infestation is lower than it has been in the last 3 years. In the southeastern part of the State where the infestation is usually most severe it is increasing at present, owing to rainy weather; however, most of the cotton is well beyond the point where the weevil can cause serious injury.

Texas. F. L. Thomas (July 3): With the exception of northern Texas, control measures are needed in most areas where cotton fields are in the vicinity of shelter in which weevils could have spent the winter. On 52 farms in 21 counties from Jim Wells to McLennan, the average infestation

ranges from 9 percent in central Texas to 28 percent in the southern part.

BOLL WORM (Heliothis obsoleta Fab.)

Georgia. T. L. Bissell (July 6): A 40-acre field of cotton at Zebulon is infested and many squares are damaged.

Oklahoma. F. A. Fenton (July 20): The cotton boll worm has caused very little damage to cotton.

Texas. F. L. Thomas (July 10): Boll worm moths are leaving cornfields and beginning to lay eggs in cotton in Nueces County. (July 17): Boll worms are noticeable in many fields.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Mississippi. C. Lyle (July 23): No specimens of this insect have been found in Mississippi.

Louisiana. Miss. Weekly Cotton Insect Rpt., State Plant Bd. (July 21): The cotton leaf worm was found at Tallulah, just 17 miles from Vicksburg, Miss., on July 17. The worm was about one-third grown.

Arkansas. D. Isely (July 23): The cotton worm was reported from Jefferson County on July 16.

Texas. F. L. Thomas (July 3): Leaf worms are occurring in Cameron and Hidalgo Counties. Excepting the Burleson County record already reported, none has been received from central Texas. (July 17): A new generation of leaf worms, the fourth since this pest reached the State, is now appearing in Burleson County, and was first found in Bell County on July 14.

GARDEN WEBWORM (Loxostege similalis Guen.)

Oklahoma. F. A. Fenton (July 20): The garden webworm caused injury to cotton in the southwestern part of the State, records of serious injury being received from Dewey, Kiowa, Comanche, and Caddo Counties. The larvae in some cases have developed in alfalfa fields and when the alfalfa was destroyed by grasshoppers they migrated to cotton. In other cases the larvae developed in carelossweeds and when these were destroyed, they turned their attention to cotton. In Comanche County several thousand acres of cotton were ruined by the pest, with the damage there being reported as more serious to cotton than that caused by grasshoppers. This pest has reached the pupal stage.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Puerto Rico. L. C. Fife (May): Infestation is already rather high and in the long season before harvest an unusually heavy infestation



is expected. The only other plants in which the pink bollworm has been found are Maga (Montezuma speciosissima) and Clamor (Thespesia populnea) and only when these are growing within 2 or 3 miles of infested cotton.

#### COTTON APHIDS (Aphididae)

North Carolina. C. H. Brannon (July 15): A serious infestation of Anuraphis maidi-radicis Forbes on cotton has been reported from Sampson County.

Tennessee. G. M. Bentley (July 16): A general outbreak of the cotton aphid (Aphis gossypii Glov.) occurred on June 27 in Obion, Franklin, and Tipton Counties.

Missouri. L. Haseman (July 24): Since the middle of July there has been an unusually heavy outbreak of cotton aphids on cotton in southeastern Missouri. Notwithstanding the abundance of ladybeetles, syrphid flies, and hymenopterous parasites, aphids have seemingly been able to do more damage during July than we have ever before known them to do.

#### COTTON FLEA HOPPER (Psallus seriatus Reut.)

Oklahoma. F. A. Fenton (July 20): In Bryan County the flea hopper infestation averages 11 percent, ranging from 5 to 14 hoppers per 100 plants.

Texas. F. L. Thomas (July 3): Cotton flea hoppers were more abundant during the week ending June 27 in Jim Wells, Nueces, and San Patricio Counties than in the other 23 counties worked. There was a slight decrease from the record of the previous week in Victoria County, and an increase for the counties farther up the coast. Flea hoppers are still increasing in the northern counties of the State. While the average number of hoppers found in central Texas was lower than in other parts of the State, it represents an increase for the farms in this area.

Texas. F. L. Thomas (July 10): Flea hoppers are not severe on the older cotton in southern Texas, but are increasing in Victoria, Fort Bend, Williamson, Ellis, Dallas, and Rockwall Counties. (July 17): There was a remarkable increase of young flea hoppers in Nueces and in Refugio Counties.

#### A LEAFHOPPER (Graphocephala versuta Say)

North Carolina. C. H. Brannon (July 15): Has caused serious damage to cotton in Iredell and Cleveland Counties. (Det. by Z. P. Metcalf.)

#### THRIPS (Thysanoptera)

Alabama. J. M. Robinson (July 16): Thrips are very active in Cullman, Marshall, Madison, Limestone, and Winston Counties.

F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

F O R E S T   T E N T   C A T E R P I L L A R (Malacosoma disstria Hbn.)

New England. J. V. Schaffner, Jr. (July 20): Severe infestations of the forest tent caterpillar occurred in Windham, Windsor, southern part of Orange, Addison, Rutland, and Bennington Counties, Vt., also in the vicinity of Charlestown, Sullivan County, N. H., and in the northwestern part of Berkshire County, in Massachusetts. In the regions that were severely infested in 1935 it was found, in most cases, that the defoliation was far more extensive this year. Dead and dying sugar-maple trees were noted at Bennington, Pawlet, and Randolph, Vt. Defoliated areas range from a few shade trees in a village to several hundred in larger towns, where nearly all sugar-maple and elm trees are almost completely stripped of foliage, or in sugar orchards and mixed-hardwood forests range from 1 to 100 acres or more. The most extensive areas completely defoliated in Vermont were noted in Rutland County, in the northern part of Bennington County, and in the northern part of Windsor County. In the counties mentioned above, thousands of acres are from 50 to 75 percent defoliated.

Michigan. R. Hutson (July 17): Adults are numerous in the vicinity of Gaylord, Cheboygan, and Traverse City.

A T E N T   C A T E R P I L L A R (Malacosoma constricta Stretch)

Washington. I. W. Bales (July 20): Larvae were collected in the vicinity of Goldendale, in Klickitat County, on May 20. Nearly all of the oak trees were defoliated. This is the only record we have of the occurrence of this insect in the State.

W H I T E - M A R K E D   T U S S O C K   M O T H (Hemerocampa leucostigma S. & A.)

Ohio. E. W. Mendenhall (July 2): The white-marked tussock moth was found defoliating street and park trees in Piqua, Miami County.

G Y P S Y   M O T H (Porthetria dispar L.)

New England. A. F. Burgess (July 18): Reports indicate a considerable decrease in the number of acres showing from 75 to 100 percent defoliation in the New England States, as compared with last summer. In towns located within a radius of 25 miles of Boston, a comparative increase in the degree of defoliation is reported.

New Hampshire. L. H. Worthley (July 27): A report has been received from the district inspector at Concord that gypsy moth egg clusters were deposited in southern New Hampshire on June 30.

Maine. H. B. Peirson (July): There have been numerous heavy outbreaks during June and July in southern Maine. On July 23 adults were



flying and ovipositing at Newcastle. Chickadees are numerous in the area and are catching the moths. Hemlock, beech, maple, oak, and pine have been stripped.

SATIN MOTH (Stilpnotia salicis L.)

New England. J. V. Schaffner, Jr. (July 15): Reports received from widely separated localities in New England indicate that infestations of this pest are on the increase.

Maine. H. B. Peirson (July): Heavy feeding of satin moth on poplar and willow during June at Mechanic Falls and South Portland.

CANKERWORMS (Geometridae)

Maine. J. V. Schaffner, Jr. (July 15): Between Biddeford and Kennebunk about 50 acres of woodland was badly infested on June 15. Near Biddeford Pool 60 acres of woodland was 75 percent defoliated on June 25. At Cape Porpoise about 40 acres was 60 percent defoliated. At Kennebunkport about 40 acres was partly defoliated on June 16. Serious outbreak on street trees at Kennebunk, West Kennebunk, and Scarborough on June 15, some practically defoliated.

H. B. Peirson (July): Heavy infestation of fall cankerworm (Alsophila pomataria Harr.) at Bristol on June 26 on maple, oak, and witch-hazel. Heavy infestation on June 26 also of lime-tree looper (Erannis tiliaria Harr.) on maple, oak, and witch-hazel.

Minnesota. A. G. Ruggles and assistants (July): Spring cankerworm (Paleacrita vernata Peck.) and fall cankerworm very abundant on elms and boxelder trees in Thief River Falls. Trees completely defoliated for the third consecutive year.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

North Carolina. C. H. Brannon (July 27): The bagworm is unusually destructive throughout the State.

Mississippi. C. Lyle and assistants (July 23): Numerous complaints of bagworms have been received during the past month. Many cedars have been stripped at Aberdeen.

Arkansas. W. J. Baerg (July 16): Bagworms are much more abundant than last year. They have defoliated practically all of the boxelder trees in Fayetteville and Springdale; have stripped many of the soft maples; and have damaged severely many sycamores, hard maples, walnuts, and pecans. The caterpillars are from one-half to two-thirds grown, indicating that the damage is only about half complete.

Oklahoma. F. A. Fenton (July 20): Bagworms are injurious to small cedar and evergreen trees at the present time.



GREEN-STRIPED MAPLE WORM (Anisota rubicunda Fab.)

Tennessee. G. M. Bentley (July 16): Destroying shade trees in the Copper-hill section of Polk County on June 25.

A CATERPILLAR (Datana sp.)

Kansas. H. R. Bryson (July 23): Datanas defoliated much of the native sumac. Considerable defoliation also occurred on apple, smokebush (Rhus cotinus), and oak.

ASH

A CARPENTER WORM (Prionoxystus sp.)

North Dakota. F. G. Butcher (July 21): Carpenter worms are generally abundant and apparently becoming more numerous in various localities. Have seen serious injury to ash, elm, and poplar in plantings at Fargo, Towner, Minot, and Williston.

A RHINOCEROS BEETLE (Xyloryctes satyrus Fab.)

Wisconsin. E. L. Chambers (July 20): Seven large ash trees in the vicinity of Mindoro were found to be heavily infested. Fifty-eight adults were counted under one tree at one time.

BEECH

EUROPEAN BEECH SCALE (Cryptococcus fagi Baer.)

New York and Connecticut. J. V. Schaffner, Jr. (July 22): R. C. Brown reports considerable increase in the intensity of European beech scale infestations at Roslyn, Long Island, and Scarsdale, N. Y., and at Hartford, Conn.

BOXELDER

BOXELDER LEAF ROLLER (Gracilaria negundella Chamb.)

Colorado. G. M. List (July 23): The boxelder leaf roller defoliated many boxelder trees in the foothills early in the season.

CATALPA

CATALPA SPHINX (Ceratomia catalpae Riv.)

New Jersey. E. Kostal (July 7): The catalpa sphinx has been very destructive on catalpa trees for the past several years at Morganville, in Monmouth County. The first caterpillars were noted on June 30 this season.

Ohio. E. W. Mendenhall (July 1): The catalpa sphinx is quite bad and has defoliated the catalpa trees in Rome, Franklin County.

### ELM

#### ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Vermont. H. L. Bailey (July 23): The elm leaf beetle is very abundant in Middlebury and Windsor, moderately abundant in most of the larger towns in the southern half of the State, and present on the west side as far north as Winooski.

Massachusetts. J. V. Schaffner, Jr. (July 20): In some localities in the southern part of Worcester and Middlesex Counties some of the elms not sprayed are showing the effects of feeding by larvae.

New York. R. D. Glasgow (July 29): The elm leaf beetle is completely destroying the foliage of elm trees in parts of Albany. This insect is still troublesome in many parts of southeastern New York, but is much less generally injurious than it has been from time to time during the past 6 years.

Michigan. R. Hutson (July 17): The elm leaf beetle was reported from Grosse Pointe Park, in Wayne County.

Ohio. T. H. Parks (July 22): Damage from this insect has been limited largely to European elms in the larger cities. In Columbus the infestation is very local with serious defoliation occurring only in a few isolated points.

Idaho. C. Wakeland, University of Idaho (July 22): Unsprayed elms throughout southwestern Idaho are brown and defoliated.

#### A BARK BEETLE (Hylurgopinus rufipes Eich.)

Rhode Island. A. E. Stene (July 24): A check up on elm diseases this spring in southern Rhode Island has resulted in finding one elm infested.

#### ELM LEAF MINER (Kaliosysphinga ulmi Sund.)

Maine. H. B. Peirson (July): Late in June there was a fairly heavy infestation of elm leaf miner at Belfast and a heavy infestation at Bremen.

#### MOORING-CLOAK BUTTERFLY (Hamadryas antiopa L.)

Georgia. T. L. Bissell (July 13): The spring elm caterpillar reported at Experiment June 1, 1936, on page 138 of the Bulletin, turned out to be the butterfly Polygonia interrogationis Fab., and not H. antiopa. It emerged about May 30.

Nebraska. M. H. Swenk (July 24): The spiny elm caterpillar (H. antiopa) was reported defoliating elm trees in Custer County on June 26.

ELM COCKSCOMB GALL (Colopha ulmicola Fitch)

Indiana. J. J. Davis (July 20): Elm cockscomb has been reported as abundant in many sections of the State.

Illinois. W. P. Flint (July 20): This aphid has been more than usually abundant on elms, many specimens having been received.

Michigan. R. Hutson (July 17): Cockscomb gall on elm is reported from Tawas City, Belleville, and East Lansing.

AN ELM LEAF APHID (Tuberculatus ulmifolii Monell)

Vermont. H. L. Bailey (July 23): The elm leaf aphid is very abundant on American elms in Montpelier and the streets and sidewalks are sticky with honeydew. Lesser infestations have been reported in St. Johnsbury and Barre.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Ohio. E. W. Mendenhall (July 15): Young European elm scale is present on elm foliage. This pest has become quite troublesome, especially in nurseries and city plantings. On July 1 it was quite bad in Columbus on shade trees and on elms in nurseries.

Indiana. J. J. Davis (July 20): Reports of infestations have been received from Jonesboro and South Bend. The specimens from Jonesboro collected on June 27 were hatching when received.

Idaho. F. C. Craighead (May): Elm trees infested with the European elm scale at Wallace, in Shoshone County.

LINDEN

LINDEN WART GALL (Cecidomyia verrucicola O. S.)

Rhode Island and New York. E. P. Felt (July 25): The linden wart gall was extremely abundant on the lower branches of linden trees at Philipsdale, R. I., and at Beacon, N. Y.

LOCUST

LOCUST TWIG BORER (Ecdytolopha insiticiiana Zell.)

Tennessee. G. M. Bentley (July 16): The locust twig borer was reported as damaging locust trees on the campus of the high school at Blanche, Lincoln County, on June 29.



MAPLE

A FRUIT WORM (Graptolitha laticinerea Grote)

Maine. H. B. Peirson (July): G. laticinerea defoliating maple on June 26 at Lincoln.

COTTONY MAPLE SCALE (Pulvinaria vitis L.)

Ohio. E. W. Mendenhall (July 15): The cottony maple scale was found to some extent on soft-maple trees on the streets of Columbus.

Indiana. J. J. Davis (July 20): Cottony maple scale continues to be received from Lafayette northward. The first young hatching were observed on June 22 from specimens collected that day at Chesterton.

Michigan. R. Hutson (July 17): Cottony maple scale has been reported as numerous at Birmingham and on maple and quince at St. Joseph.

South Dakota. H. C. Severin (July 18): More abundant than usual. Attacking trees and vines. Egg masses are conspicuous.

MOUNTAIN ASH

MOUNTAIN ASH SAWFLY (Pristiphora geniculata Htg.)

Maine. H. B. Peirson (July): Numerous complaints have been received of defoliation of mountain ash in July.

New England. J. V. Schaffner, Jr. (July 24): Heavy infestations noted by H. J. MacAloney on July 17-22, throughout the northern part of New Hampshire and Vermont and south as far as Petersham, Mass.

OAK

OAK TWIG PRUNER (Hypermallus villosus Fab.)

Maine. H. B. Peirson (July): The oak twig pruner has been infesting central and southern Maine during the latter part of July. Numerous complaints received of injury.

New England, New York, and New Jersey. E. P. Felt (July 25): The maple and oak twig pruner is generally abundant and somewhat injurious in southwestern New England, southern New York, and northern New Jersey.

Connecticut. W. E. Britton (July 22): Apparently more prevalent than in 1935. Its work has been observed in many localities and specimens have been received from Beacon Falls, Hamden, Middletown, New Milford, and Wilton.

Michigan. R. Hutson (July 17): The oak twig pruner has been reported as working on apple at St. Joseph and at Belding.

PINE

SAWFLIES (Neodiprion spp.)

Maine. H. B. Peirson (July): Light larval feeding of Abbot's pine sawfly (N. pinetum Nort.) on pine at Sweden on July 10.

Massachusetts. J. V. Schaffner, Jr. (July 15): At Groton a plantation of about 4 acres of red pine was severely injured this spring by Neodiprion sp. On June 16, thousands of freshly formed cocoons were noted in leafmold around bases of trees.

EUROPEAN PINE SHOOT MOTH (Rhyacionia buoliana Schiff.)

New York. J. V. Schaffner, Jr. (July 15): In a plantation of about 500 red-pine trees, 10 to 12 years of age, at Syosset, Long Island, N. Y., most of the trees are dead or dying. These trees have been heavily infested by the European pine shoot moth for several years past, which caused many post horns, bushy tips, and dead stubs, thus greatly weakening their condition. A few trees died in 1934, more in 1935, and this year the number of dead and dying greatly increased so that only a few living red pine remain at one end of the stand. An examination made a few days ago disclosed a severe infestation of Pissodes approximatus Hopk. (larvae, pupae, and adults) and some larvae of Kylobius pales Hbst.

Indiana. J. J. Davis (July 20): European pine shoot moth reported to be rather common on Mugho pine at South Bend.

A PINE TIP MOTH (Eucosma gloriola Heinr.)

Connecticut. M. P. Zappe (July 24): White pines in nearly all parts of the State infested. Injury more abundant than any year since insect was first noticed in Connecticut.

DOUGLAS-FIR CATERPILLAR (Euschausia argentata Pack.)

Colorado. J. A. Beal (May): A tent caterpillar, tentatively determined as E. argentata, was found doing considerable damage to young ponderosa pine on the San Juan and San Isabel National Forests, in southern Colorado. The tops of infested trees were badly defoliated by May 1 and the larvae have continued to feed throughout May. The larvae collected and placed in rearing were so heavily parasitized by a braconid, Meteorus acronyctae Mues., that very few reached maturity.

PITCH-MASS BORER (Parharmonia pini Kellicott)

Tennessee. G. M. Bentley (July 16): Pine-bark pitch borer reported damaging white pine at Crossville, Cumberland County, on July 14.

A TORTRICID (Tortrix pallorana Rob.)

Michigan. R. Hutson (July 17): Larvae were found defoliating all kinds of pine, except red pine, at Augusta and East Lansing. The larvae work on the new growth. This insect has been previously reported only from clover, strawberries, grass, herbs, and deciduous trees. (Det. A. Busck.)

COTTONY PINE SCALE (Pseudophilippa quaintancii Ckll.)

Alabama. J. M. Robinson (July 16): The cottony pine scale is conspicuously active on pine trees in Talladega and Cullman Counties.

PLANETREE

SYCAMORE SCALE (Stomacoccus platani Ferris)

California. Kern Co. Agr. Comm. Monthly News Letter (July 6): Sycamore scale was found on one tree this year for the first time in Kern County.

POPLAR

POPLAR SAWFLY (Trichiocampus viminalis Fall.)

Michigan. R. Hutson (July 17): The poplar sawfly has been numerous on Carolina poplar at East Lansing and Fenton.

VAGABOND GALL APHID (Mordwilkoja vagabunda Walsh)

Michigan. R. Hutson (July 17): Vagabond galls on poplar are numerous about East Lansing and Grosse Pointe Park.

SPRUCE

EUROPEAN SPRUCE SAWFLY (Diprion polytomum Htg.)

Maine. H. B. Peirson (July): European spruce sawfly larvae were feeding on spruce and adults were emerging in northwestern Maine on June 15-25. Adults emerged up to July 17. Larvae were feeding along the coast between Rockland and Brunswick on June 26.

New Hampshire. J. V. Schaffner, Jr. (July 24): On July 22 H. J. MacAloney reported that the European spruce sawfly infestations throughout New Hampshire and Vermont are very light. The first generation of the sawfly was completed by July 1 in southern New England.

SPRUCE BUDWORM (Harmoloba funiferana Clem.)

Ohio. E. W. Mendenhall (July 19): The spruce budworm was found in some nurseries in Franklin County on ornamental trees.

Minnesota. A. G. Ruggles (July 22): Very abundant in a few northern counties.



INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

FOUR-LINED PLANT BUG (Poecillocapsus lineatus Fab.)

Connecticut. W. E. Britton (July 22): Specimens of the four-lined plant bug or characteristic injury to tender leaves of aster, chrysanthemum, forsythia, honeysuckle, heliotrope, and pepper have been received from Branford, East Haven, Guilford, Hamden, Hartford, Meriden, New Haven, and Windsor.

CORN SAP BEETLE (Carpophilus pallipennis Say)

Nebraska. M. H. Swenk (July 24): From Dawes County on June 29 came a report that these beetles were destroying rose blooms and also attacking the blooms of regal lilies.

GLADIOLI

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Maryland. E. N. Cory (June 30): Thrips are generally attacking gladiolus.

Alabama. J. M. Robinson (July 16): Gladiolus thrips are causing concern at Talladega.

Mississippi. C. Lyle (July 23): Complaints of thrips on gladiolus were received from Moss Point, Hurley, and Meridian.

Wisconsin. E. L. Chambers (July 20): Severe damage to gladiolus has been observed by the nursery inspectors in many commercial plantings throughout the State.

HONEYSUCKLE

EUROPEAN HONEYSUCKLE LEAF ROLLER (Cerostoma xylostella L.)

Michigan. R. Hutson (July 17): C. xylostella was feeding on honeysuckle at Grand Rapids in June.

HOLLY

HOLLY FIREWORM (Rhopobota naevana ilicifoliana Kearf.)

Maryland. G. S. Langford (June 30): Holly fireworm attacking holly at Annapolis. (Det. by C. Heinrich.)

RED-BANDED LEAF ROLLER (Argyrotaenia velutinana Walk.)

Maryland. G. S. Langford (June 30): This insect was collected on holly at Annapolis. (Det. by A. Busck.)

JAPANESE LANTERN

THREE-LINED LEMA (Lema trilineata Oliv.)

Wisconsin. C. L. Fluke (July 21): The three-lined lema is abundant in Madison on Japanese lanterns. Adults and larvae present on July 7.

OLEANDER

POLKA-DOT WASP MOTH (Syntomocida epialis Walk.)

Florida. J. R. Watson (July 20): The polka-dot wasp moth has reappeared in Gainesville on oleanders for the first time since the severe cold of December 1934.

PALM

ROYAL PALM BUG (Xylastodoris luteolus Barber)

Florida. E. W. Berger & G. B. Merrill (July 21): Royal palm bug is reported by J. C. Goodwin as being very abundant and severe on royal palms in Palm Beach County.

ROSE

ROSE CURCULIO (Rhynchites bicolor Fab.)

Nebraska. M. H. Swenk (July 24): The rose curculio was reported attacking roses in Johnson County on June 26 and in Grant County on July 3.

Utah. G. F. Knowlton (July 1): The rose snout beetle has been damaging rosebuds at Ogden.

ROSE SAWFLY (Caliroa aethiops Fab.)

Indiana. J. J. Davis (July 20): Rose sawfly reported abundant on rose at Syracuse on June 29.

I N S E C T S   A T T A C K I N G   M A N   A N D

D O M E S T I C   A N I M A L S

MAN

MOSQUITOES (Culicidae)

South Carolina. F. Sherman and associates (July 22): Around Clemson there is more mention of mosquitoes than usual, and in our observation a large percentage of those causing annoyance on porches are of the Anopheline group, perhaps resulting from garden fish pools not adequately stocked with top minnows.

Texas. E. C. Cushing (July 27): Aedes aegypti L. was very abundant on July 13 at San Antonio about residences throughout the city and was causing extreme annoyance to the inhabitants.

SANDFLIES (Culicoides spp.)

New York. R. D. Glasgow (July 29): Sand flies were abundant and annoying on a salt marsh near Woodmere, Long Island, on July 13.

Florida. F. C. Bishopp (July 18): Reports have come from a number of localities along the eastern coast of Florida of an unusual abundance of sand flies, and some physicians and others are associating these insects with a fever which has been prevalent in certain localities along that coast. The epidemiology of the disease appears to point to sand flies as possible vectors.

BEDBUGS (Cimex lectularius L.)

North Carolina. R. W. Leiby (July 15): Bedbugs are more common than ever in my experience in the State and complaints are received daily.

CHIGGERS (Trombicula irritans Riley)

Maryland. F. C. Bishopp (July 27): Chiggers have been unusually abundant and widespread this year in the vicinity of the District of Columbia. Areas where chiggers have not been known to occur have shown considerable infestation during July.

Missouri. L. Haseman (July 24): We have received fewer complaints of chiggers this year than for many years, in fact they have apparently caused no annoyance at all this year.

TICKS (Dermacentor spp.)

Utah. G. F. Knowlton (July 8): Ticks, D. andersoni Stiles, have been taken on man in Utah at Salt Lake City and Logan, and on cow and rabbit at Vernon.

Maryland. F. C. Bishopp (July 27): The American dog tick (D. variabilis Say), vector of Rocky Mountain spotted fever in the East, is still present in large numbers. Eleven cases of the disease, one resulting in death, have been reported from Maryland since July 1. Reports of cases by counties are: Anne Arundel, 3; Cecil, 1; Frederick, 2; Montgomery, 4; and Prince Georges, 1 (death). This brings Maryland's total for the year to 17 cases, of which four have resulted in death.

BLACK WIDOW SPIDER (Latrodectus mactans Fab.)

Rhode Island. A. E. Stene (July 24): A female black widow spider was recently sent in by a correspondent from Cranston.



Nebraska. M. H. Swenk (July 24): An inquiry as to the control of the black widow spiders that were infesting a storage cave in Custer County was received on July 10.

### CATTLE

#### SCREW WORM (*Cochliomyia americana* C. & P.)

General. W. E. Dove (July): Screw worms are greatly reduced in the Southeastern States, but are numerous in the old infested area of Texas, with strong tendencies to spread toward the North Central States. For the first 3 weeks of July there were approximately one-seventh as many cases (2,931) in the Southern States east of Texas as there were for the same area during the corresponding period of last year (20,754 cases). The distribution of the pest was limited by the severe weather of last winter principally to the peninsular portion of Florida, but during the spring months local infestations were stamped out at Barbour, Ala., in western Florida, in some central counties of Georgia, and in Berkeley County, S. C. In the Western States the reservoir of infestations is in Texas, but specimens were also identified from the Imperial Valley of California and Eddy County, N. Mex. Several cases were also reported as occurring in hogs and sheep in Arizona. From 68 counties in Texas, 16,251 cases of screw worms were reported during the 3 weeks ending July 18 and 14,650 cases were reported from 63 counties during the single week ending July 24. The larger numbers occurred in the eastern and northern parts of the sheep- and goat-raising sections. In these sections shearing was somewhat later than elsewhere and was not completed before screw worm flies became active. The fly populations following shearing appear to be responsible for a northward spread of the pest, which was most noticeable along routes where animals were shipped. Screw worms infested 6 of the southern counties of Oklahoma and are now being reported from more northern localities of that State. Specimens were found in a cow in the stockyards of St. Louis, Mo., which had been shipped from Kenedy, Tex. Some were identified from a sheep in the Prospect Yards at Kansas City, which had been billed from Fort Worth, Tex., and 6 cases were found in one car of cattle shipped from San Angelo to a point in central Texas.

#### STABLE FLY (*Stomoxys calcitrans* L.)

Alabama. J. M. Robinson (July 16): The stable fly developed in Autauga and Mobile Counties during the first part of July in sufficient numbers to warrant control measures.

Missouri. L. Haseman (July 24): During July there has been one of the most annoying infestations of stable flies in central Missouri that we have ever had.

Nebraska. M. H. Swenk (July 24): Inquiries as to control of stable flies on livestock came from Thurston and Richardson Counties.

## HOUSEHOLD AND STORED-PRODUCTS INSECTS

### ANTS (Formicidae)

Mississippi. C. Lyle (July 23): Complaints about ants have been received almost daily during the month. In most cases they were unaccompanied by specimens, but undoubtedly the fire ant (Solenopsis xyloni McCook) and the tiny black ant (Monomorium minimum Buckl.) were the chief offenders. The Argentine ant (Iridomyrmex humilis Mayr) was causing trouble in some colonies of bees at Kosciusko. Dorymyrmex pyramicus Roger was reported as attacking calves at Nettleton on July 3, causing sores on the bodies of animals.

Nebraska. M. H. Swenk (July 14): On July 14 the large black carpenter ant (Camponotus herculeanus pennsylvanicus Deg.) was reported working in a living tree in Douglas County.

Oklahoma. C. F. Stiles (July 25): The dry weather of the past 3 years has been very favorable for the harvester ants (Pogonomyrmex barbatus F. Smith). They are so numerous in Payne County at the present time that a petition has been circulated by the farmers asking for assistance in control.

## HESSIAN FLY INFESTATION AT HARVEST TIME 1936

C. M. Packard, Senior Entomologist,  
Division of Cereal and Forage Insect Investigations,  
Bureau of Entomology and Plant Quarantine,  
U. S. Department of Agriculture.

The following information on current hessian fly conditions was obtained through surveys conducted principally by the staffs of Bureau of Entomology and Plant Quarantine field laboratories located at Manhattan and Wichita, Kans.; Lafayette, Ind.; and Carlisle, Pa. Credit for assistance in such surveys is given the Entomologists of the States of Illinois and Ohio.

As shown by the accompanying map, these surveys include the main winter-wheat regions of the Central and Eastern United States. The severity of the outbreak observed in progress of development last fall was considerably moderated by subsequent weather conditions unfavorable to fly activity. The unusually heavy late fall brood suffered considerable winter mortality. Unfavorable spring weather conditions, such as drought, sudden freezes, prolonged subnormal temperatures, and heavy rains, at critical times during the development of the spring brood combined to check the progress of the outbreak to a considerable extent. However, moderate to severe spring infestations developed throughout a rather large area extending from east-central Missouri through central and southern Illinois, widening to include most of western Indiana and narrowing again to continue across southern Indiana into southwestern Ohio (see map). Light to moderate infestations also occurred in some localities of southern Michigan, east-central Ohio, and north-central Pennsylvania. The most severely infested area included southern Illinois, southern Indiana, and southwestern Ohio. In this area most of the fields observed were injured to some extent and much fallen straw was in evidence. It is in this area that the greatest danger of serious fall infestation is apparent.

Judging from rather fragmentary evidence from Illinois, Indiana, and Ohio, the rate of mortality in the aestivating puparia due to desiccation and parasites is unusually high. Several dissections made at Lafayette during early August showed only 1 to 9 percent live puparia. Summer mortality, however, is always high and, at least in the areas of moderate to heavy spring infestation, enough flies will undoubtedly survive the summer to produce a heavy fall brood if normal or above-normal rainfall should occur



in late August and early September. The farmers in these areas should be advised to observe the safe sowing dates, plow wheat stubble under well before seeding time, and to destroy volunteer wheat wherever possible. The last two measures are more practicable than usual in the East Central States because of the death from drought of the clover stands in many wheat stubble fields.

Following is a summary of the data on which this report is based.

Area	Fields sampled Number	Stems infested		
		Average Percent	Maximum Percent	Minimum Percent
<u>Nebraska</u>				
Southwest-----	8	0	0	0
South-central-----	21	0	2	0
Southeast-----	25	1	6	0
<u>Kansas</u>				
Northwest-----	22	(1)	4	0
North-central-----	29	3	4	0
Northeast-----	45	1	8	0
South-central-----	38	1	16	0
Southeast-----	64	3	22	0
<u>Oklahoma</u>				
North-central-----	21	0	0	0
Northeast-----	31	(1)	4	0
<u>Missouri</u>				
Northwest-----	23	3	20	0
West-central-----	35	7	30	0
East-central-----	44	11	38	0
Southwest-----	33	4	36	0
Southeast-----	26	7	50	0
<u>Illinois</u> (Mostly from survey by State entomologists.)				
Northern-----	29	10	83	0
West-central-----	77	21	74	0
East-central-----	24	23	64	2
Southern-----	51	41	94	10
<u>Michigan</u>				
Southern-----	48	12	44	0
<u>Indiana</u>				
Northwestern-----	35	25	88	0
Northeastern-----	31	7	26	0
West-central-----	31	25	74	0
East-central-----	55	9	36	0
Southwestern-----	43	33	82	6
Southeastern-----	33	34	80	0

Area	Fields sampled	Stems infested		
		Average	Maximum	Minimum
	Number	Percent	Percent	Percent
<u>Ohio</u> (From survey by State entomologists)				
Northwestern-----	90	6	0	0
Northeastern-----	130	11	0	0
Southwestern-----	110	18	0	0
<u>Pennsylvania</u>				
West-central-----	15	4	22	0
North-central-----	20	14	48	0
Southeastern-----	70	4	14	0
<u>Maryland</u> -----				
	40	5	18	0
<u>Delaware</u> -----				
	15	1	6	0
<u>Virginia</u>				
Northwest-----	20	4	20	0
Northeast-----	45	6	40	0
South-central-----	15	1	4	0
<u>North Carolina</u>				
Central-----	30	1	6	0









## THE MORE IMPORTANT RECORDS FOR AUGUST 1936

The serious grasshopper situation in the Great Plains continued throughout August. During the month many reports were received of the hoppers defoliating shade and fruit trees, where other vegetation had been destroyed. Large populations of grasshoppers were also reported from the East Central States.

Distribution records indicate that Mormon crickets are widely prevalent in North Dakota and Montana.

In the southern Mississippi Valley the fall armyworm is moderately abundant in many places.

Japanese beetles show a notable increase in intensity this year in Connecticut and New York.

Say's stinkbug was found in Dickey County, N. Dak., east of its previously known distribution, and Scotts Bluff County, Nebr., and was present in damaging numbers in north-central Montana.

Hessian fly surveys indicate severe infestations in the East Central States, extending from the southwestern corner of Ohio, across the southern half of Indiana and the southern two-thirds of Illinois, with moderate infestations extending into east-central Missouri.

The corn ear worm was notably scarce throughout practically the entire country, with the exception of a rather heavy infestation in the Great Basin, Utah.

Peak flights of adults of the codling moth occurred during the first week in August in New York State, during the third week in August in Indiana, and during the second week in August in Washington State. Infestations in the East Central States are generally quite heavy.

Extensive injury to the terminal growth of potatoes by a plant bug, Lygus elisus Knight, was reported from North Dakota.

Very severe damage to late tobacco by the tobacco flea beetle was reported from North Carolina.

The cotton boll weevil was reported as rapidly increasing in numbers in North and South Carolina, Alabama, parts of Mississippi, and parts of Texas, while in other parts of Texas there was a decided reduction in populations.



In general, bollworm infestation is subnormal throughout the Cotton Belt, with a few localities reporting damage.

Leafworm damage has been checked in the lower Mississippi Valley by hot, dry weather, a few localities reporting damage.

The pink bollworm has been found in the lower Rio Grande Valley, at San Benito, Brownsville, and Rio Grande City. This is the most serious cotton insect of the month.

The alder flea beetle was unusually prevalent throughout the northern New England States and northern New York. A severe outbreak of this insect occurred also in the Targhee National Forest in Idaho. A blowfly, Paralucilia fulvipes Macq., formerly only known from the coastal part of California was collected in several localities in Arizona. Although this species is primarily a carcass breeder, there is some evidence that it may cause myiasis in animals.

#### THE MORE IMPORTANT FEATURES IN CANADA IN JULY AND AUGUST 1936

Severe drought and high temperatures in the Prairie Provinces have aggravated the grasshopper situation. In Manitoba the grasshoppers are doing considerable damage to late crops in southwestern sections and in the Heskett district, but are comparatively scarce in the central part. Egg laying commenced early in August. In Saskatchewan the infestation of adults is generally heavier than that of last autumn. Egg laying was general in the northwest at the end of July and was beginning in southern districts. Concentration of the grasshoppers for egg laying resulted in some head damage to grain crops. Effective baiting was carried out throughout the entire west-central portion of the province, where the infestation was most severe. In Alberta grasshoppers are widespread and injurious. They have migrated to good crop areas and are causing some losses to wheat, but are particularly serious on coarse grains. A heavy increase and partial outbreak over most of the Dry Belt in the interior of British Columbia is reported and the outlook for 1937 is considered serious.

Blister beetles, of which Nuttall's blister beetle is a prevalent species, are abundant in areas of grasshopper outbreak, in the Prairie Provinces and the interior of British Columbia, causing damage to shrubs and garden plants.

The moth flight of the pale western cutworm had started in southern Alberta in mid-August and the abundance of the moths indicates a severe infestation in 1937.

Infestations of the wheat stem sawfly are severe generally in Saskatchewan and damage is increased by premature ripening and thin crops. In Alberta the wheat is being cut by the sawfly in all districts south of Stettler, and especially in areas of good crop.

The wheat stem maggot is not so abundant in Manitoba as in past years, but in northeastern and eastern districts of Saskatchewan it is causing some damage to wheat by producing white sterile heads.

The wheat midge has caused considerable loss in spring wheat in the Victoria district, Vancouver Island. It is also present in serious numbers at Lumby and Salmon Arm, in the interior of British Columbia.

Reports indicate that the Colorado potato beetle is unusually abundant in Ontario and the Prairie Provinces. In Saskatchewan infestations were found to occur almost as far north as the limits of settlement.

Following the occurrence of large and extensive flights of the beet webworm in the Prairie Provinces this spring, weeds, sugar beets and garden plants in many districts suffered injury from the larvae.

An increase in the European corn borer infestation in southern Ontario has occurred, but probably there will be little commercial loss to the corn crop.

The gladiolus thrips is now well established on southern Vancouver Island, in British Columbia.

The European earwig is more numerous than ever in coastal sections of British Columbia and is causing many complaints.

The pea moth is prevalent in pea-growing sections of the Gaspé Peninsula, Quebec.

Heavy infestations of the red turnip beetle, with consequent losses to garden plants, are reported in parts of Saskatchewan and Alberta.

The roundheaded apple tree borer is more numerous than in previous years in orchard sections of southern Quebec. The apple curculio and the plum curculio are very injurious to the apple crop in this region, as the crop is very light, following destructive spring frosts.

The rosy apple aphid was the outstanding insect pest early this summer in orchards of the Annapolis Valley, Nova Scotia. It was also more abundant and destructive than for many seasons in the Niagara district, Ontario. In the latter area, what threatened to be an unusually severe outbreak of the apple aphid was brought under control by extremely hot and dry weather.

The oriental fruit moth infestation in southern Ontario continues at a very low level and the insect is of much less importance than during any season since it became generally distributed over the peach-growing districts of the province. The peach borer is unusually injurious in the Niagara district.

There has been a pronounced reduction in the population of grape leafhoppers in the Niagara district, and it is believed that the outbreak, which

commenced in 1931, is definitely on the wane.

The European larch sawfly has increased in numbers throughout the southern half of New Brunswick and in some parts of Nova Scotia. Slight damage at scattered points has occurred in Prince Edward Island. In the Fernie area of British Columbia, a great reduction in this species is apparent this season.

Outbreaks of the yellow-headed spruce sawfly have been very severe in many parts of the three Prairie Provinces. The only areas that have escaped have been the most southerly portions.

Caterpillars of the cecropia moth have done considerable damage to boxelder in southern Saskatchewan.

The satin moth infestations in the Maritime Provinces have been more severe and widespread than in previous years.



GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

Vermont. H. L. Bailey (August 19): Grasshoppers, Melanoplus sp., are very abundant in scattered spots about the State. Danville, in Caledonia County, Bridport in Addison, Newfane in Windham, and Tunbridge in Orange are localities of greatest abundance.

Ohio. T. H. Parks (August 25): Grasshoppers have increased in number during the summer and now approach normal numbers in many meadows and pastures. Notwithstanding the extreme drought, we have had call for aid in controlling grasshoppers in only two counties, in each of which the outbreak was local.

Indiana. C. M. Packard and assistants (August 13): Grasshoppers are very abundant and doing serious damage in many cornfields in Tippecanoe County and other northern localities.

Illinois. W. P. Flint (August 20): Nearly all grasshoppers are now in the adult stage and mating is taking place generally. No eggs have been found. Many cornfields will suffer 25 to 50 percent loss of crop and a few fields will be completely destroyed.

Michigan. R. Hutson (August 24): Numerous small local infestations of grasshoppers, principally M. mexicanus Sauss., have been reported in southern Michigan. Injury to young orchards fairly prevalent.

North Dakota. F. Gray Butcher (August 18): Grasshoppers continued to cause concern during the past month, being reported as from moderately to very abundant in 35 counties. Injury to gardens and late flax fields in the drought area has been severe. A survey being conducted indicates that M. mexicanus is the predominant species.

Iowa. H. E. Jaques (August 23): Grasshoppers continue to be the most serious insect problem. Recent trips through many counties in western Iowa revealed great abundance. In some districts the weeds are all stripped to the main stem and even the thistles are being eaten.

Missouri. H. Baker (August 26): Grasshoppers have defoliated many young orchards throughout the section around Saint Joseph, where the trees have not been protected by bait and sprays. Older, bearing trees have suffered little damage, although some isolated trees, trees in outside rows, and low hanging limbs on other trees have been defoliated.

Nebraska. M. H. Swenk (August 24): There is quite a large grasshopper population. Damage to the leaves of trees was commonly reported during the last 10 days in July, and loss of corn was complained of until about August 10, when the destruction of the corn by the drought reduced the reports of crop damage.

Miss. H. R. Bryson (August 19): Grasshoppers (Melanoplus spp.) continued to be the outstanding pests last month. Visits to western and north-western counties revealed the fact that few trees bordering wheat fields escaped defoliation. Cornfields were completely stripped of their leaves. In many instances the stalks were eaten close to the ground. Sorghums for the most part were not attacked. The defoliation of orchard trees and alfalfa fields is general. The absence of weeds and succulent vegetation in waste areas brought about by the drought has forced the hoppers to the green cultivated crops. The population is such that the second generation and adults of the first generation will cause considerable injury to fall-sown alfalfa and winter wheat.

Oklahoma. C. F. Stiles (August 19): For the past 3 weeks grasshoppers have been defoliating many of the shade trees along the streams and along the fence rows through the northeastern and western parts of the State. In Mayes County in the northeastern and Woods County in the northwestern part of the State, practically all the trees, including fruit trees, have been defoliated. No doubt many of the trees will die because the hoppers are getting every tender shoot that appears. They have been extremely hard to poison during the hot weather, as they are not feeding much on the ground and are hunting cooler, shady places, such as the north sides of fence posts and trees. Approximately 2,000 tons of bait have been prepared and distributed throughout the State.

Montana. A. L. Strand (August): About 3,000 tons of bait have been used in Montana this season, mostly in the counties along the Yellowstone River where infestations of grasshoppers in irrigated crops have been very heavy.

Utah. G. F. Knowlton (July 31): Grasshoppers are much more abundant in many parts of Cache County than they were a year ago. Most abundant in fields are M. packardii Scudd., M. mexicanus, M. femur-rubrum Deg., M. bivittatus Say, Aulocara elliotti Thos., and Dissosteira carolina L. (August 8): Grasshoppers have caused severe stripping of wheat and alfalfa north of Paragonah, and much damage west of Parowan in Iron County. Many M. bivittatus and M. packardii have died of disease.

#### LUBBER GRASSHOPPER (Romalea microptera Beauv.)

Alabama. J. M. Robinson (August 13): Lubber grasshoppers were reported as very abundant, attacking flowers on lawns at Uniontown on August 3.

#### MORMON CRICKET (Anabrus simplex Hald.)

North Dakota. F. Gray Butcher (August 18): The distribution of Mormon crickets over the State is increasing. Reports indicate that the crickets are present generally throughout Ward County, have also been found in numbers in Burleigh and Stark Counties, and a few individuals in Divide and Pierce Counties.

Montana. A. L. Strand (August): Mormon cricket infestations are about the same as in 1935, with some extension of the outbreak into southeastern



Montana. The area includes the territory bounded by Glacier, Pondera, Teton, Cascade, Meagher, Park, Carbon, Big Horn, Powder River, Custer, Rosebud, Musselshell, Golden Valley, Wheatland, Judith Basin, Chouteau, Liberty, and Toole Counties. Smaller infestations are present in Sanders and Lake Counties, west of the Divide.

PALE WESTERN CUTWORM (Porosagrotis orthogonia Morr.)

Montana. A. L. Strand (August): Damage by the pale western cutworm was more severe than in any year since 1932. The main area affected lies in north-central Montana in Cascade, Teton, Pondera, Toole, Liberty, Hill, and Chouteau Counties.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

North Carolina. C. H. Brannon (August 15): This insect is still causing damage in many sections of the State.

Georgia. T. L. Bissell (August 28): The fall armyworm is very abundant on grass at Experiment.

Tennessee. G. M. Bentley (July 22): The fall armyworm has been doing serious damage in the following places: Locks Creek, in Cannon County, on millet, sorghum, and corn; Tiptonville, in Lake County, on June 1, on alfalfa.

Alabama. J. M. Robinson (August 13): The fall armyworm was moderately abundant near Huntsville during the last week of July.

Mississippi. C. Lyle (August 24): The southern grassworm was reported injuring corn at Yazoo City on July 31 and at Greenwood on August 3. Inspector Jack Milton reported it as causing moderately severe damage near Brandon. At State College it was causing serious damage to young corn on August 22.

ARMYWORM (Cirphis unipuncta Haw.)

Kentucky. M. L. Didlake (August 24): Late summer brood outbreaks in counties of southern and central Kentucky--Russell, Metcalfe, Wayne, Cumberland, Hart, and Clinton. They have eaten crabgrass in fields of lespedeza and soybeans, but the legumes were not attacked. Principal damage was done to corn, the blades being eaten off nearly up to the ears. Many of the worms have eggs of tachinid fly parasite on them.

BEEET WEBWORM (Loxostege sticticalis L.)

Montana. A. L. Strand (August): The second generation of larvae has not shown up, although the flight of moths was enormous. This is the first year since 1932 that an outbreak of this species has occurred.

A. L. Gibson (July 6): Range plants and weeds, including Russian-thistle, have been severely defoliated at Whitchall, in Jefferson County. This is the first record in this area.



Utah. G. F. Knowlton (August 19): Larvae are leaving Russian-thistle, upon which they are abundant, and moving to potatoes, alfalfa, and garden vegetables in the Panguitch and Junction areas. (August 24): Beet webworms are damaging sugar beets in the Price-Castle Dale area, and are moving from weeds to potatoes at Panguitch and Junction, causing considerable injury. Vegetables in gardens are also damaged when weed hosts are abandoned.

#### WIREWORMS (Elateridae)

Alabama. K. L. Cockerham (August): It is estimated that there has been a potential reduction in price of 20 cents for each 100-pound bag of potatoes produced in Baldwin and Escambia Counties this year, owing to damage to the tubers by the Gulf wireworm (Heteroderes laurentii Guer.). A total of approximately 992,500 100-pound bags were produced in these two counties this season.

Mississippi. J. P. Kislanko (July 30): One adult of H. laurentii was collected at Hattiesburg, Forrest County, in garbage. This is the first record for the county.

North Dakota. F. Gray Butcher (August 18): In some of the potato-growing areas, especially in the Red River Valley, Ludius spp. and Limonius spp. have been causing considerable injury to the developing tubers.

#### WHITE GRUBS (Phyllophaga spp.)

Indiana. P. Luginbill and H. R. Painter (July 30): White grubs seriously damaged a lawn near Culver. Infestation averaged 7 grubs per square foot. The grubs are maturing, therefore they belong to brood C, the adults of which will emerge next spring. The corn in our variety-test plots at Crown Point shows serious damage, many plants being practically destroyed. Infestation averages 5 grubs per hill, with a maximum of 11. These are second-year grubs belonging to brood A, the adults of which will emerge in the spring of 1938.

Michigan. R. Hutson (August 24): White grubs have been reported as working on blueberry at South Haven; also causing trouble on dahlias at East Lansing, and to corn at Plainwell.

Minnesota. A. G. Ruggles and assistants (August): White grubs very abundant in Mower, Fillmore, Dakota, and Winona Counties.

Nebraska. M. H. Swenk (August 24): Complaints of injury to lawns were received from Buffalo and Madison Counties on July 24 and August 17, respectively, and to a strawberry bed in Franklin County on July 30.

#### JAPANESE BEETLE (Popillia japonica Newm.)

Connecticut. W. E. Britton (August 21): A considerable increase in numbers over last year is noticed in Hartford, New Haven, and Bridgeport. Riverside Park, Hartford, is heavily infested and soil treatment will

be started next week. Specimens of adults have been received from Hamden, Hartford, New Canaan, New London, and three lots from New Haven.

Massachusetts. L. H. Worthley (August 10): On the first survey of a greenhouse in Springfield one Japanese beetle was collected.

New York. R. D. Glasgow (August 18): The Japanese beetle is reported by State Bureau of Plant Industry Inspectors as notably more in evidence on the wing this season in parts of Westchester County and the lower Hudson Valley than it was last year.

Pennsylvania. L. H. Worthley (August 10): A number of new infestations were found in nurseries in southeastern Pennsylvania, and a single new infestation was discovered in an establishment in the north-central part of the State. There has been a decided decrease in the number of beetles present in Philadelphia this year.

Maryland. L. H. Worthley (August 10): Three beetles were found in a nursery located outside the regulated area at Timonium, Baltimore County.

#### ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

New York. R. D. Glasgow (August 18): The Asiatic garden beetle has been reported by State Bureau of Plant Industry Inspector to be unusually abundant in parts of Westchester County this season, where the adult beetle has caused annoyance by entering houses.

#### SAY'S STINK BUG (Chlorochroa sayi Stahl)

North Dakota. F. Gray Butcher (August): Say's plant bug was collected in wheat fields in Dickey County during the latter part of July. This appears to be the known eastern limit of its distribution in the State. The first record of its presence in North Dakota was from southwestern counties, Billings and Bowman, in 1934.

Nebraska. M. H. Swenk (August 24): Specimens were received from Scotts Bluff County on July 20.

Montana. A. L. Strand (August): Say's plant bug is present in damaging numbers over a wide area in north-central Montana.

#### COMMON RED SPIDER (Tetranychus telarius L.)

Ohio. T. H. Parks (August 25): The common red spider has been very serious on many ornamentals and some vegetables. We received specimens of bean plants from Marietta showing very serious injury from this pest.



- Michigan. R. Hutson (August 24): Red spiders are very numerous on all sorts of deciduous trees, including orchard and shade trees in Lansing, Jackson, Monroe, Adrian, and Albion.
- Kentucky. M. L. Didlake (August 24): Red spider abundant on dahlias at Pineville.
- North Carolina. C. H. Brannon (August 10): We are experiencing red spider damage quite extensively on cotton.
- Alabama. J. M. Robinson (August 13): Red spider was reported attacking butter beans at Moulton on July 30, having spread from violets and sunflower plants near the edge of the garden.
- Mississippi. C. Lyle (August 24): Damage to phlox from red spider was reported from Aberdeen on August 10. It was reported as moderately abundant on ornamentals at Meridian and Jackson.
- Missouri and Kansas. H. Baker (August 26): Red spider can now be found in all orchards in the section around St. Joseph, Mo., and Wathena and Troy, Kans. It has done and is still doing much damage.
- Utah. G. F. Knowlton (August 14): Red spiders are damaging corn at Cannonville.
- California. H. J. Ryan (August 27): Damage by the two-spotted mite became suddenly apparent in August over about 3,000 acres of English walnuts in the San Fernando Valley. This is the first time this mite has been reported in the San Fernando Valley as doing serious damage. Occasional instances of minor injury have occurred previously in other parts of Los Angeles County, where a general infestation with a light population was found this year.

## CEREAL AND FORAGE - CROP INSECTS

### WHEAT

#### HESSIAN FLY (Phytophaga destructor Say)

- General. C. M. Packard (August): The results of a survey of hessian fly conditions at harvest time are being published under date of August 31, 1936 as supplement to No. 6 of the Insect Pest Survey Bulletin.
- Ohio. T. H. Parks (August 25): The following is the result of an analysis made of 122 puparia in Pickaway County on August 20: Live larvae 2.7 percent; parasitized, 44.4; dead from causes other than parasitization, 52.9; total dead, 97.3. With such high percentage of mortality, it is doubtful whether the fly will be a serious menace this fall in any part of Ohio.



Indiana. C. M. Packard (August 13): Infestations at harvest time were light in the east-central and northeastern parts of the State. In the remainder of the State many fields were heavily infested, with attendant prospects of infestation in the wheat to be sown next fall. These prospects are being materially reduced by continued drought and high mortality of the puparia.

Illinois. W. P. Flint (August): The hessian fly situation has changed markedly since the fall of 1935. At present there is a general moderate to heavy infestation in all parts of Illinois, with the exception of approximately the northeastern fourth of the State, where the infestation is low, running from 3 to 8 percent. In all other sections of the State the infestation will run from 15 to 50 percent and will average about 30 percent for the western and southern sections, with the highest infestation in the State showing on the east side of Crawford and Lawrence Counties. Owing to the extremely hot and dry weather, there has been a high mortality of the fly in its summer, or flaxseed, stage. It is probable that the infestation this fall will be moderate, even in areas where the infestation last spring was high.

#### WHEAT JOINTWORM (Harmolita tritici Fitch)

Illinois. W. P. Flint (August): The wheat jointworm is of no importance in Illinois, except in the southern fourth of the State. It is fairly abundant south of a line drawn through southern Madison, Clinton, Marion, Clay, Richland, and Lawrence Counties. North of this line it is of no consequence.

#### CORN

#### CHINCH BUG (Blissus leucopterus Say)

North Carolina. C. M. Brannon (August 16): Late corn in Pitt County is being seriously damaged.

Indiana. C. Benton (August 13): First-brood adults still numerous and mating. Second brood now in from first to fifth instar and abundant in many fields in Tippecanoe County. Little mortality. Conditions mostly favorable to development.

Illinois. W. P. Flint (August 20): Second-brood bugs have developed in moderate-to-large numbers over most of the central and northwest-central parts of the State. It is still too early to make any predictions for next year, but apparently there will be a rather heavy carry-over. The infestations are, as in 1935, very spotted.

Iowa. H. E. Jaques (August 23): Chinch bugs have done some rather serious damage in southern Iowa.

Kansas. H. R. Bryson (August 22): Chinch bugs may be found in corn and sorghum fields in about all stages. They are not present in alarming numbers.

CORN LEAF APHID (Aphis maidis Fitch)

Illinois. G. M. Bentley (July 22): Corn leaf aphid reported by County Agent of Cannon County as causing considerable damage on sorghum at Woodbury.

CORN LANTERN FLY (Perognathus maidis Ashm.)

Mississippi. C. Lyle (August 24): Three or four heavy infestations of the corn lantern fly have been observed on late corn in Jackson and Harrison Counties by Inspector H. Gladney. On August 22 a heavy infestation of this insect was noticed on young corn at State College.

CORN EAR WORM (Heliothis obsoleta F.)

Connecticut. N. Turner (August): In southern Connecticut about 2 percent of the early sweet corn was affected. The second generation has not appeared.

Maryland. G. Myers (August 25): Around Rockville the field corn is remarkably free from infestation by the corn ear worm. We have not seen a single worm in the sweet corn in our garden.

Ohio. T. H. Parks (August 25): Corn ear worms are very scarce on market garden corn. No complaints have been received and personal inspections revealed very few damaged ears. Infestations in greenhouses have been reported. These probably were due to the fact that the insect overwintered there.

Indiana. E. V. Walter (August 13): Extremely scarce in corn at Lafayette. Early worms have all matured and left the corn. No eggs have been seen since early July.

Illinois. W. P. Flint (August 20): Corn ear worm is very scarce in the State. Examinations of canning corn show only from 3 to 5 percent infestation.

Iowa. H. E. Jaques (August 23): Many counties report moderate to heavy damage from corn ear worms.

Tennessee. G. M. Bentley (August 19): The injury is less this year than it has been for several years generally throughout the State.

Alabama. J. M. Robinson (August 13): The corn ear worm is very abundant in central Alabama.

Utah. G. F. Knowlton (August 28): Damage to corn is somewhat lighter than it has been for 2 years. Injury to tomato fruit in northern Utah ranges from 3 to 6 percent. The highest injury is approximately 11 percent in one field at Corinne.

CORN ROOT WORM (Diabrotica longicornis Say)

Minnesota. A. G. Ruggles (August 22): The western corn root worm was reported as doing damage at Willmar, Kandiyohi County.

COWPEAS

PEA APHID (Illinoia pisi Kalt.)

Georgia. O. I. Snapp (July 23): Aphids were very abundant on and caused considerable damage to field peas at Fort Valley during the latter part of July.

MEALYBUGS (Pseudococcus sp.)

Georgia. J. R. Thomson, Jr. (July 23): Mealybugs are more abundant than usual on field peas and other plants at Fort Valley.

GRASS

SOD WEBWORMS (Crambus spp.)

Kentucky. M. L. Didlake (August 24): Second-brood adults are more numerous than at any time this season--August 5 to 20--at Lexington.

California. J. C. Elmore (August 18): The sod webworm has become very destructive to new lawns in the San Gabriel Valley. The population ranges from 5 to 10 per square foot. All new lawns in this area are affected.

CHINCH BUG (Blissus hirtus Montd.)

Rhode Island. A. E. Stene (August 26): For the first time in 25 years the chinch bug has been sent into the office with a complaint that it is destructive to grassland. Not commonly present in injurious numbers in Rhode Island.

CROTALARIA

BELLA MOTH (Utetheisa bella L.)

Alabama. J. M. Robinson (August 13): Larvae are appearing in large numbers on Crotalaria at Crossville.

SUGARCANE

TERMITES (Isoptera)

Louisiana. B. A. Osterberger (August 3): About 60 percent of the stalks in a low spot in a sugarcane field at Anchorage, West Baton Rouge Parish, were damaged by termites. The feeding was near the surface of the ground and in some instances the entire pith was destroyed.



## FRUIT INSECTS

### APPLE

#### CODLING MOTH (Carpocapsa pomonella L.)

- New York. D. W. Hamilton (August): At Poughkeepsie comparatively heavy moth captures have continued in light and bait traps since July 26. Peak flight of first-brood adults occurred on the nights of August 2 and 3. Several of the poorly sprayed orchards are from 20 to 50 percent injured.
- Ohio. T. H. Parks (August): Heaviest second-brood bait-pan catch was made between July 15 and 22. Another peak occurred on August 1. New larval entrances were appearing in such numbers as to justify a special spray during the second week of August in a few northern orchards. While the codling moth has made a remarkable come-back during the dry season, the situation is not serious except where spraying for the second brood was omitted.
- Indiana. L. F. Steiner (August 25): Activity of second-brood adults at Bicknell apparently reached its peak on August 19 when the catch in 318 traps amounted to 4,025 moths, as compared to the spring-brood peak of 700 moths on May 17, and the first-brood peak of 1,776 on July 11. At Vincennes in 20 traps the spring-brood peak of 158 moths occurred on May 17, the first-brood peak of 320 on July 6, and the second-brood peak of 209 on August 19.
- Illinois. W. P. Flint (August 20): Third-brood codling moth is very general in southern Illinois. The infestation on the average is fully as heavy as in 1934. In many cases the crop will be infested almost 100 percent.
- Kentucky. M. L. Didlake (August 24): Codling moths are still numerous at Lexington, second generation of adults flying.
- Missouri. H. Baker (August 26): Damage from second- and third-brood worms has been held to a minimum, owing to the extreme heat and drought, therefore damage has been light except in poorly sprayed or unsprayed orchards. Bait-trap catches indicated that second-brood moths appeared about August 10.
- Tennessee. G. M. Bentley (August 19): There has been an unusually heavy infestation of the second brood on apples generally over the State. Commercial orchardists report that difficulty has been experienced in controlling the second brood with the regular spray.
- Montana. A. L. Strand (August): Codling moth is present in greatly reduced numbers in Bitter Root Valley and Flathead Lake districts.
- Washington. E. J. Newcomer (August 20): Emergence of first-brood moths at Yakima has progressed in much the same manner as in 1935. A high point was reached on August 17, but the maximum may come later.

APPLE LEAF SKELETONIZER (Psorosina hammondi Riley)

Indiana. A. J. Ackerman (August 25): The apple leaf skeletonizer is very abundant in a moderately sprayed orchard at Elberfeld. Injury is quite conspicuous also in several poorly sprayed orchards near Vincennes.

FLATHEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Alabama. J. M. Robinson (August 13): The flatheaded apple tree borer was reported by the county agent at Linden as being very active on 3- or 4-year-old water oaks that had been transplanted.

Michigan. R. Hutson (August 24): Flatheaded apple tree borers are numerous at Goodells and Pinckney.

Nebraska. M. H. Swenk (August 24): Complaints of damage to shade and fruit trees continued to be received during the month.

APPLE APHID (Aphis pomi Deg.)

Ohio. T. H. Parks (August 25): The green aphid has been serious in some orchards of northeastern Ohio, where curling of the terminals has occurred. The outbreak terminated about the middle of August.

BUFFALO TREEHOPPER (Ceresa bubalus F.)

Iowa. H. E. Jaques (August 23): In Polk County we found apple orchards rather severely injured by the egg-laying scars of the buffalo treehopper.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Connecticut. P. Garman (August 21): European red mite is more abundant than it has been during the last 5 or 10 years. Its enemies are less abundant than usual.

PEACH

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (August 21): The second generation is unusually abundant in New Haven County and the third generation threatens serious damage.

Illinois. W. P. Flint (August 20): Oriental fruit moth caused far less damage than in 1935. The most heavily infested orchards show only about 6 or 7 percent infestation, as compared with 60 percent in 1935.

Georgia. O. I. Snapp (August 20): the infestation continues light in yard trees at Fort Valley, although the insect has damaged some late varieties of peaches. It is of no economic importance in the commercial orchards here. Of 34, 612 Elberta peaches cut open and examined this year, not one was found to be infested. These peaches were harvested from an orchard in which no control measures against the moth were taken.



Tennessee. G. M. Bentley (August 19): Oriental fruit moths have been found in heavy infestations on peach twigs throughout the State.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (August 20): There is a moderate infestation of the peach borer at Fort Valley. The moth emergence season is somewhat earlier than usual and has been fairly heavy for the last 2 weeks.

Michigan. R. Hutson (August 24): The peach tree borer has been reported from Saranac, Ionia, Albion, and Lansing.

PEACH TWIG BORER (Anarsia lineatella Zell.)

Utah. G. F. Knowlton (August 19): Peach twig borers are causing much damage to peach fruits and twigs at Hurricane and La Verkin.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia. O. I. Snapp (August 20): Extensive jarring during the month shows that there are practically no adults on peach trees in commercial orchards around Fort Valley. A diligent search in peach orchards, near by woodlands, and other favored places of hibernation failed to locate any adults during the past month.

RED-LEGGED FLEA BEETLE (Derocrepis erythropus Melsh.)

New York. W. E. Blauvelt (May 22): At Poughkeepsie in a peach orchard near a locust grove this insect was found feeding on the peach foliage, eating through the leaves.

PLUM

LEAF CRUMPLER (Mineola indigenella Zell.)

Texas. F. L. Thomas (July 30): Rather abundant on plum at Port Arthur and along the upper coastal district of Texas.

RASPBERRY

RASPBERRY FRUITWORM (Byturus unicolor Say)

Montana. A. L. Strand (August): Raspberry byturus has been the cause of heavy losses to raspberry growers in the Bitter Root Valley.

BLACKBERRY

RASPBERRY ROOT BORER (Bembicia marginata Harr.)

Washington. J. Wilcox and W. W. Baker (August 3): An infestation on bush blackberries reported at Alderton, where 25 hills in a row had been dug and examined and all were infested with larvae or pupae. Apparently few, if any, of the adults have emerged.



BLUEBERRY

CRANBERRY FRUITWORM (Mineola vaccinii Riley)

Michigan. R. Hutson (August 24): Cranberry fruitworm has been moderately abundant on cultivated blueberries at South Haven.

GRAPE

GRAPE SAWFLY (Erythraspides pygmaea Say)

Connecticut. W. E. Britton (August 21): Several nearly full-grown larvae were received from Norwich.

WESTERN GRAPE SKELETONIZER (Harrisina brillians B. & McD.)

Utah. G. F. Knowlton (August 20): Western grape leaf skeletonizer was reported as defoliating grapes and virginia creepers at Blanding.

PECAN

PECAN WEEVIL (Curculio caryae Horn)

Georgia. M. du Pree (August 15): Pecan weevil very abundant on pecan at Milner, in Lamar County, Strouds, in Monroe County, and Experiment, in Spalding County.

HICKORY NUT CURCULIO (Conotrachelus affinis Boh.)

Mississippi. C. Lyle (August 24): Specimens from pecan were received from Greenwood on August 11.

CITRUS

CITRUS WHITEFLY (Dialeurodes citri Ashm.)

Alabama. J. M. Robinson (August 13): The adult whitefly was emerging the last week of July and the first week of August in Auburn, having developed on the foliage of the various species of privet. They are not so abundant as they were during the past 2 years.

Mississippi. C. Lyle and assistants (August 24): A heavy infestation on ornamentals in Harrison County and a moderate infestation on cape jasmine at Ridgeland, Jackson, and Meridian.

Texas. S. W. Clark (July 30): D. citri and D. citrifolii Morg. present on citrus at Mercedes. Injury by the latter-named species was rather severe in June.

PURPLE SCALE (Lepidosaphes beckii Newm.)

Mississippi. C. Lyle (August 24): L. beckii was apparently spreading in a

satsuma orchard in the southern part of the State during the past month.

COTTONY-CUSHION SCALE (Icerya purchasi Mask.)

Mississippi. H. Gladney (August 24): Four or five infestations have developed in Jackson and Harrison Counties.

TRUCK - CROP INSECTS

BLISTER BEETLES (Meloidae)

Nebraska. M. H. Swenk (August 24): Epicauta lemniscata F. continued to damage tomato and other plants in Otoe, Lancaster, and Clay Counties during the latter part of July, and Macrobasis albida Say and E. maculata Say were reported from Box Butte County on August 7.

Oklahoma. E. Hixson (August 19): Blister beetles (Epicauta spp.) are beginning to cause concern. They are feeding on tomato and various weeds, Swiss chard, and other plants.

Montana. A. L. Strand (August): Blister beetles, mostly E. maculata, have been unusually abundant over most of the State, particularly along the Yellowstone River. Severe damage to potatoes, sugar beets, and caragan

FALSE CHINCH BUG (Nysius ericae Schill.)

North Dakota. F. Gray Butcher (August 18): Requests for information concerning the false chinch bug continue to come to the office, but these insects are not so abundant as they were a few weeks ago.

Montana. A. L. Strand (August): The false chinch bug is more numerous than ever before observed in the State. Most of damage to potatoes.

Utah. G. F. Knowlton (August 28): The false chinch bug is abundant and causing injury to vegetables in northern Utah.

NORTHERN MOLE CRICKET (Gryllotalpa hexadactyla Perty)

Nebraska. M. H. Swenk (August 24): From Hayes and Sheridan Counties came specimens for identification.

POTATO AND TOMATO

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Michigan. R. Hutson (August 24): Adults, eggs, and larvae are numerous in the vicinities of Chatham and Gaylord.

Tennessee. G. M. Bentley (July 18): Colorado potato beetle is present in

large numbers in western Tennessee, and also in eight counties on the Cumberland Plateau in eastern Tennessee.

POTATO FLEA BEETLE (Epitrix cucumeris Harr.)

North Dakota. J. A. Munro (August 18): The potato flea beetle is generally distributed and moderately abundant over the potato-growing district of the eastern border counties.

POTATO LEAFHOPPER (Empoasca fabae Harr.)

Connecticut. N. Turner (August 21): Reports of serious damage to dahlias from the potato leafhopper in several sections of the State.

Michigan. R. Hutson (August 24): Potato leafhopper is numerous at East Lansing on dahlias, potatoes, and alfalfa.

North Dakota. J. A. Munro (August 18): Moderately abundant in the potato-growing districts in the Red River Valley.

Texas. S. W. Clark (August 1): E. fabae is infesting all varieties of cow-peas. This insect is one of the most important limiting factors in the production of fall beans in southern Texas.

A PLANT BUG (Lygus elisus Van D.)

North Dakota. F. Gray Butcher (August 18): This mirid has been causing some injury to the terminal growth of potatoes. In some fields the injury has been quite extensive. (Det. by H. H. Knight.)

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. A. E. Michelbacher (August 20): In a tomato field at Visalia on July 16 I examined 400 tomatoes and found only 1 of them infested with the tomato pinworm. On August 8 I visited this same field and found that 12 percent of the fruits were infested with this pest.

J. C. Elmore (August): The tomato pinworm has not caused heavy losses in southern California this year. Only traces of infestation in most of the summer tomato-growing areas, with an occasional case of 1 to 2 percent fruit damage. In the highland areas the pinworm continues to be a major pest with 25 to 50 percent fruit damage.

TOMATO WORMS (Protoparce spp.)

Michigan. R. Hutson (August 24): Trouble from tomato worms has been common about Monroe, Lansing, Jackson, Alpena, and Saginaw.

Iowa. H. E. Jaques (August 23): The tomato sphinx, though not so abundant as in many years, has caused serious trouble at this time when growth has been unusually difficult.



## BEANS

### MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

- Maryland. T. L. Bissell (August 24): Mexican bean beetle is very injurious to lima beans in the vicinity of Westover.
- Ohio. T. H. Parks (August 25): The Mexican bean beetle has not been very serious since late in July and has apparently been reduced by the extreme heat and drought.
- Tennessee. G. M. Bentley (August 19): Generally over Tennessee this year there has been a very light infestation of the Mexican bean beetle.
- Alabama. J. M. Robinson (August 13): Larvae are active, after several rains in the last week of July and the first week of August.
- Missouri. J. C. Dawson (July 6): A specimen of the Mexican bean beetle was taken from a Japanese beetle trap in St. Louis on June 24. This is believed to be the first specimen ever taken in the State. (Identified by E. A. Chapin.)

### BEAN LEAF BEETLE (Cerotoma trifurcata Forst.)

- Mississippi. C. Lyle (August 24): The bean leaf beetle was causing considerable damage to soybeans at Greenwood on August 15. At State College the insect was ruining garden beans and cowpeas on August 22. The damage seems rather general.

### LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

- Georgia. O. I. Snapp (August 17): The lesser cornstalk borer is unusually abundant at Fort Valley and has ruined some large fields of snap and lima beans.

## CABBAGE

### IMPORTED CABBAGE WORM (Ascia rapae L.)

- Ohio. R. H. Davidson (August 17): Adults are very abundant at Columbus. Many of the larval stages are parasitized.
- Michigan. R. Hutson (August 24): Cabbage worms are causing damage at Harrison and Holland.
- Iowa. H. E. Jaques (August 23): Cabbage worms have been serious in many gardens and in the market-garden districts.
- Utah. G. F. Knowlton (August 1): Cabbage worms are damaging cabbage at Bort and Tremonton, in Box Elder County. (August 19): Cabbage worms are damaging cabbage at Hurricane, and adult moths were extremely abundant along the highway near Gunnison. Injuring cabbage in the Spanish Fork district.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Ohio. R. H. Davidson (August 17): A few larvae were observed on cabbage grown on the State Farm at Columbus. The injury is of minor importance.

CABBAGE LOOPER (Autographa brassicae Riley)

Ohio. R. H. Davidson (August 17): Larvae are very abundant on cabbage grown on the State Farm at Columbus. The infestation is heavy and injury is severe. On account of the humid weather prevailing at present, many of the larval stages are dying from a bacterial disease.

Mississippi. C. Lyle (August 24): The cabbage looper was reported by L. J. Goodgame as causing serious damage to mustard in Monroe County on August 21. On the same date it was unusually destructive to fall turnips at State College.

FLEA BEETLES (Malticinae)

South Carolina. C. O. Bare (August 24): At least three species of flea beetles are involved in a severe attack on the seedlings of a 10-acre planting of cabbage in the Charleston area. A number of growers report similar trouble. The striped flea beetle (Phyllotreta vittata F.) and an undetermined species both present in approximately equal numbers are responsible for the greater part of the damage.

CABBAGE APHID (Brevicoryne brassicae L.)

Ohio. R. H. Davidson (August 7): Injury by the cabbage aphid is noticeable on cabbage at Columbus. Parasites and predators are keeping the insect in check.

Nebraska. M. H. Swenk (August 11): From Dawson County comes the complaint of the cabbage aphid infesting cabbage plants.

Utah. G. F. Knowlton (August 24): Cabbage aphids are injuring cabbage in the Spanish Fork area.

MELONS

CUCUMBER BEETLES (Diabrotica spp.)

California. J. C. Elmore (August 6): Cucumber beetles, D. soror Lec., D. balteata Lec., and D. trivittata Mann., were very numerous on watermelon vines at Chula Vista, San Diego County. The beetles had eaten from one-half to all of the green surface from many of the melons, causing them to have the color of muskmelons.

R. E. Campbell (August 7): The following is quoted from the Los Angeles County Farm Bureau Monthly, August, 1936, page 7: "A few serious cases of bacterial wilt have appeared in several squash

and melon patches of the El Monte-Puerto District. All of these cases have followed bad infestations of cucumber beetles."

MELON APHID (Aphis gossypii Glov.)

Georgia. O. I. Snapp (July 28): Late watermelons at Fort Valley and Marshallville had heavy infestations of aphids late in July. A number of growers applied for information on control measures.

Kentucky. M. L. Didlake (August 24): Melon aphids destructive on cucumber vines, but outbreak controlled by ladybeetles (Hippodamia convergens Guer.) at Lexington.

Nebraska. M. H. Swenk (August 24): Inquiries as to control of the melon aphid on cucumbers were received from Gosper and Lancaster Counties.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Ohio. R. H. Davidson (August 17): Adults were noticed as very numerous on squash on a farm at Columbus. Eggs and last-instar nymphs are also abundant and the injury is rather severe.

Nebraska. M. H. Swenk (August 19): From Custer County comes a complaint of squash bugs killing squash and pumpkin vines.

Kansas. H. R. Bryson (August 22): Squash bugs are very abundant, or at least the population is concentrated on the squash and pumpkin vines that escaped the effects of the drought.

Utah. G. F. Knowlton (August 28): Numerous observations and reports of injury by the squash bug have been made this season.

SQUASH BORER (Melittia satyriniformis Hbn.)

Michigan. R. Hutson (August 24): Squash vine borers are causing trouble at Kalamazoo and Allegan.

ONIONS

ONION THRIPS (Thrips tabaci Lind.)

Connecticut. N. Turner (August 21): Severe thrips infestation on seed onions at Mt. Carmel farm.

STRAWBERRY

CYCLAMEN MITE (Tarsonemus pallidus Banks)

Oregon. W. W. Baker (July 9): The largest strawberry grower in the vicinity of Parkdale is going out of the business due to the trouble encountered in controlling Tarsonemus pallidus.



PEPPER

PEPPER WEEVIL (Anthonomus eugenii Cano)

California. J. C. Elmore (August 5): The pepper weevil is numerous in Orange County and in the northern end of San Diego County where control has not been practiced. Estimated damage or loss (by actual count of infested pods) ranges from 30 to 75 percent.

PEPPER MAGGOT (Zonosemata electa Say)

New Jersey. M. Kisliuk, Jr. (August 11): In the vicinity of Vineland on August 9 the backyard plantings of peppers were found to be from 10 to 15 percent infested with the pepper maggot. Commercial plantings in the vicinity showed from 2 to 10 percent infestation.

CARROT

CARROT BEETLE (Ligyrus gibbosus Deg.)

Nebraska. M. H. Swenk (August 24): A Pierce County correspondent reported the carrot beetle attacking the roots of marigold plants and also damaging carrot plants on August 6.

Washington. E. W. Jones (August 18): The carrot beetle was reported damaging sunflowers at Wallula on August 14.

SWEETPOTATO

GOLDEN TORTOISE BEETLE (Metritona bicolor F.)

Tennessee. G. M. Bentley (August 7): Sweetpotato or tortoise beetle occurring in large numbers on the leaves of sweetpotatoes at McMoresville, Carroll County.

SUGAR BEETS

BEET LEAFHOPPER (Eutettix tenellus Bak.)

Montana. A. L. Strand (August): Curly top of sugar beets has been practically absent this year in Yellowstone River counties. Last season damage in some fields there approached 20 percent.

TOBACCO

TOBACCO FLEA BEETLE (Epitrix parvula F.)

North Carolina. C. M. Brannon (August 25): Damage to late tobacco is universal and this is probably the most serious infestation for more than a decade.

SUCKFLY (Dicyphus minimus Uhl.)

North Carolina. C. H. Brannon (August 26): There are serious infestations of tobacco suckfly on tobacco in Martin County.

A TOBACCO WORM (Protoparce sp.)

North Carolina. C. H. Brannon (August 25): Infestations of tobacco hornworm on late tobacco are the worst in more than 10 years.

C O T T O N I N S E C T S

BOLL WEEVIL (Anthonomus grandis Boh.)

North Carolina. C. H. Brannon (August 10): Boll weevils are beginning to develop in several sections of this State. (August 25): Infestations are quite severe in many sections, other sections showing very little damage.

South Carolina. F. F. Bondy and C. F. Rainwater (August 22): Boll weevils are steadily increasing in numbers and are migrating from the old to the young cotton. (August 29): In the young cotton some fields increased from 6 to 50 percent in 1 week and much young cotton has stopped blooming because of weevil damage.

Georgia. P. M. Gilmer and P. A. Glick. (August 15): Boll weevils are moderately numerous in upland cotton and are increasing in Sea Island, the infestation being approximately 17 percent, as compared to about half that during the previous week. (August 22): Cotton showing second growth is now beginning to produce small numbers of squares, almost 100 percent of which are injured. On Sea Island cotton the increase is causing some injury. On August 17 approximately 12.5 percent of the squares examined at Nashville showed egg punctures.

Tennessee. G. M. Bentley (August 19): In the cotton-growing districts of Tennessee very little cotton boll weevil has been found.

Alabama. J. M. Robinson (August 13): Boll weevil infestation is increasing in central and southern Alabama, being 18 percent at Auburn.

Mississippi. C. Lyle (August 24): Infestation in Mississippi has continued to be extremely light and cotton plants are blooming all the way to the top, indicating no damage.

H. C. Young (August 15): Square infestation records made in 11 fields near State College, ranged from 2.17 to 59.67 percent, averaging 20.46 percent, as compared with 13.67 percent the previous week.

E. W. Dunnam and J. C. Clark (August 15-22): Boll weevils are becoming very scarce at Stoneville.

Louisiana. R. C. Gaines and assistants (August 15-29): The numbers of boll weevils taken on nine flight screens at Tallulah were as follows:

Date	1936	1935	1934
August 14---	87	37	148
August 21---	69	9	33
August 29---	63	23	82

Mr. Young and assistants examined 7,200 squares in plots that had received no treatment and found an average square infestation of 37.3 percent. This infestation ranged from 16.7 to 66.2 percent for the week ending August 15.

Arkansas. D. Isely (August 22): The boll weevil is of no economic importance in any part of Arkansas, probably because of the prevailing severe drought and high temperatures.

Oklahoma. C. F. Stiles (August 19): If the hot, dry weather continues for another 10 days boll weevil damage through the State will perhaps be the lightest on record since all of Oklahoma has been infested with the weevil. The heaviest infestation last week in southeastern Oklahoma was 0.5 percent.

Texas. F. L. Thomas (August 7): The average numbers of squares punctured by boll weevils in the several sections of the State are as follows: Southern, 60 percent; southeastern, 26 percent; south-central, 10; north-central, 5 percent; northern, 4. These figures are based on examination of 33 farms, some of which had been poisoned for leafworms and weevils. (August 28): The infestation is comparatively light in many fields but is increasing, following the setback received during the hot weather of about 2 weeks ago.

R. W. Moreland (August 1): Migration has been going on near College Station for some time in the upland cotton, as the infestation has built up rapidly during the past 2 weeks. Examined 5,400 cotton squares in upland fields during the week and 1,500 of these were in checks, where 804 punctures were found. The infestation ranged from 42.7 to 64.0 percent with an average of 53.6 percent; 2,700 squares were examined in plots that had received more than a presquare application and 870 punctures were found. The infestation in these plots ranged from 6.3 to 57.7 percent, with an average of 32.2 percent.

K. P. Ewing and R. L. McGarr (August 15): At Port Lavaca general weevil infestation is reduced from last week. Infestation records made in the check plots in the weevil experiments in Jackson County this week average 22.4 percent punctured squares, as compared with 43.9 percent last week. The reduction is no doubt due to poisoning for leaf worms (Alabama argillacea Hbn.), along with the hot, dry weather.

Mexico. C. S. Rude (August 18): Infestation at Tlahualilo, Durango, has increased rapidly in the past week. In some regions the infestation is from 70 to 80 percent in squares and from 15 to 50 percent in bolls.



PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. F. L. Thomas (August 21): By far the most important event of the week was the finding of the pink bollworm in the lower Rio Grande Valley by men from the Bureau of Entomology. The announcement Tuesday of the finding of 15 worms at San Benito and 4 at Brownsville is of sufficient importance to cause the gravest concern to all of Texas and to southern Texas in particular. The finding of 276 specimens at Matamoros and a few others at Reynosa, Mexico, 50 miles up the river, indicates that it is pretty well established on the Mexican side opposite Cameron and Hidalgo Counties. (August 28): Four counties, Cameron, Hidalgo, Starr, and Willacy, have been quarantined because of the discovery of pink bollworm in Cameron County.

A. J. Chapman (August 15): Infestation counts were made in 13 fields at Presidio during the week. These fields averaged 6.82 percent of the bolls infested, the infestation ranging from 0 to 46 percent. (August 22): Boll infestation records were made in 11 fields. The average infestation in these fields was 31.55 percent, ranging from 1 to 95 percent. Infestation in 8 of the 11 fields last year was 12.25 as compared with 34.88 percent this year. (August 29): Boll-infestation records were made in 10 fields. The average infestation in these fields was 29.60 percent, ranging from 7 to 61 percent. Infestation in 9 of the 10 fields last year was 17.67, as compared to 26.33 percent this year.

Mexico. C. S. Rude (August 18): The pink bollworm infestation is steadily increasing at Tlahualilo, Durango. Some evidences of migration are noticeable. An infestation of 70 percent was observed in a field where the previous infestation was only about 10 percent. The heavy infestation was nearly all first-instar larvae. (August 25): In most parts of the Laguna the infestation is around 80 percent. Migrations from the sections of early infestation have started and probably the entire Laguna will soon have a rather general infestation.

BOLLWORM (Heliothis obsoleta F.)

South Carolina. F. F. Bondy and C. F. Rainwater (August 22): Bollworms are doing some damage in the young cotton at Florence.

Alabama. J. M. Robinson (August 13): The cotton bollworm was damaging cotton in the Greenville district about July 28. Apparently it was moderately abundant.

Mississippi. C. Lyle (August 24): A complaint of injury by the cotton bollworm was received from Columbia on August 18.

E. W. Dunnam (August 22): In many fields at Stoneville a few bollworms are noted.

Louisiana. R. C. Gaines and assistants (August 22): Only a few scattered specimens have been observed at Tallulah. (August 29): Specimens can be found in most fields at Tallulah.

Texas. F. L. Thomas (August 7): Cotton bollworms are causing severe injury where the fields were overflowed and on river bottom lands that received heavy rains about July 1. Injury seems to be greatest in the Brazos and Colorado River bottoms and on creek bottom lands of central and southeastern Texas. (August 21): Early this week the second generation of cotton bollworm to attack cotton began to cause injury to squares. Notwithstanding the hot weather of last week and wilting of cotton in many fields, a good percentage of the young worms were reaching the squares.

K. P. Ewing and R. L. McGarr (August 15): A few scattered bollworms observed doing damage in a good many fields around Port Lavaca. (August 22): During the week there has been a very conspicuous increase in infestation and damage in the Port Lavaca district, particularly in the river bottoms and in fields where the cotton continues to make good growth. Bollworms became a very serious factor in the field-plot experiments at Edna during the week. Infestation records in the 11 cuts under observation showed an average of 11.2 percent of the squares infested. The highest average for a cut was 15.2 percent, while in some plots the infestation was as high as 25 percent. Most of the worms were small and perhaps 95 percent of the damage was confined to the squares.

R. W. Moreland (August 1): Examined 4,000 cotton terminals on six different plantations near College Station during the week and found 140 bollworm eggs and 176 bollworms ranging in size from first instar to full grown. The eggs averaged 3.5 per 100 terminals and the worms 4.4. (August 15): Examined 5,400 cotton terminals during week and found 879 eggs. Eggs ranged from 6 to 40 per 100 terminals, with an average of 16.3 as compared with an average of 2.4 eggs per 100 terminals for the past week. During the week ending August 17, 1935, 2,400 terminals were examined and 1,806 bollworm eggs were found. Eggs ranged from 60 to 84, with an average of 75 per 100 terminals. (August 22): In examining 1,500 cotton terminals, 10 per point, at 150 points in experimental plots, 264 eggs were found, or an average of 17.6 eggs per 100 terminals. This is slightly higher than for the week ending August 15.

#### COTTON LEAFWORM (Alabama argillacea Hbn.)

Michigan. R. Hutson (August 24): The first adult of A. argillacea showed up in a light trap on August 22.

South Carolina. F. F. Bondy and C. F. Rainwater (August 22): One cotton leafworm larva and a number of adults were found at Florence during the week. The first moths were caught in a light trap on the night of August 2. (August 29): Larvae and adults are found in the fields. No stripping to date.

Georgia. P. M. Gilmer and P. A. Glick (August 14): In sweepings from Sea Island cotton at Nashville we took our first and only specimen of cotton leafworm. This specimen was about half grown. (August 22): Leafworm appearing in small numbers. One adult has been reared from a larva taken on August 12. No damage apparent as yet.



Tennessee. G. M. Bentley (July 15): Cotton leafworm was found in small numbers of second-instar stages in Tipton County. Large numbers of the insect in third and fourth instars were found at Eads, in Shelby County, on July 31. At Milan, in Gibson County, cotton leafworm was just beginning to show up on August 11. Several cotton fields at Covington, in Tipton County, infested on August 1.

Alabama. J. M. Robinson (August 13): Light infestation of cotton leafworm was reported from Eastaboga, in Talladega County on July 29, with heavy infestations in the lower places. On the same date this insect was reported as being on 30 acres of cotton at Eutaw. The cotton leafworm has now been reported along the entire west side of the State and is generally distributed in the southern, central, and northern parts. Twenty-nine of the 67 counties have reported cotton infested with it. In southern and central Alabama the cotton is fairly well matured. In Greene County dusting is being done.

Mississippi. C. Lyle (August 24): The cotton leafworm was first noticed in Mississippi about July 27. Reports indicated that the infestation was rather general over most of the State, specimens and complaints having been received from a large number of widely distributed localities. The infestation was rather light in most places, but some defoliation was reported. Extremely hot, dry weather during August has checked the worms considerably.

H. C. Young (August 15): A few moths are emerging at State College and the main crop of moths will be out by the middle of next week. About 90 percent of the crop will be mature before the second generation of worms can defoliate the plants. (August 29): All green and succulent cotton plants are now heavily infested.

E. W. Dunnam (August 22): Very few worms can be found in the fields at Stoneville.

Louisiana. R. C. Gaines and assistants (August 22): Hot, dry weather has continued to hold the leafworm in check. However, it is developing to a certain extent in isolated fields in the rankest and greenest cotton around Tallulah. Moths are abundant. (August 29): Some stripping has been observed during the past week. Considerable poisoning has been done in scattered areas. This condition seems to be true throughout the parishes of East Carroll, Madison, and Tensas.

Arkansas. D. Isely (August 22): Cotton worms are generally distributed over the southern and eastern parts of the Cotton Belt in Arkansas.

Oklahoma. C. F. Stiles (August 19): Cotton leafworm has been found in three places in Oklahoma--two in McCurtain County along the Red River and one in Muskogee County along the Arkansas River.

Texas. F. L. Thomas (August 7): Leafworms are stripping untreated fields of cotton in southern Texas and severely ragging the more succulent cotton in central and eastern Texas, where control measures have not been applied.



R. W. Moreland (August 1): The cotton leafworm is beginning to rag cotton in some fields at College Station where no dusting has been done.

A. J. Chapman and assistants (August 22): The cotton leafworm infestation at Presidio continued to be spotted and in some places they are doing damage. (August 29): During the week the cotton leafworm infestation has spread generally over the Presidio Valley below the Conchos River. Only a few fields have been defoliated.

Arizona. T. P. Cassidy (August 15): Several specimens of the cotton leafworm were found by W. A. Stevenson in the experimental cotton at Fresno Papago Indian Reservation on August 12. This is the first report received at this office of leafworms in Arizona this season. The worms ranged in size from very minute to half-grown larvae, indicating that an influx of moths to this area has been taking place for several days.

#### COTTON FLEA HOPPER (Psallus seriatus Reut.)

South Carolina. F. F. Bondy and C. F. Rainwater (August 29): There are lots of hoppers in all the young cotton in the vicinity of Florence and in some fields they are doing much damage.

Georgia. P. M. Gilmer (August 22): The flea hopper is present at Tifton but doing no damage.

Mississippi. E. W. Dunnam (August 22): A few flea hoppers noted in cotton fields at Stoneville but not causing damage.

Louisiana. R. C. Gaines (August 22): P. seriatus may be found in limited numbers on croton at Tallulah. However, it is difficult to find a single specimen on cotton.

Texas. K. P. Ewing and R. L. McGarr (August 15): Flea hopper infestation observed in one field of young cotton in Calhoun County during the week. (August 22): No particular damage at this time, except in isolated fields of very young cotton.

R. W. Moreland (August 1): In some fields near College Station the population is fairly heavy. (August 15): Some injury being done by hoppers as blasted squares are noticeable in places.

#### THRIPS (Thysanoptera)

Mexico. C. S. Rude (August 11): Thrips are doing a considerable amount of damage to cotton in some fields at Tlahualilo, Durango. (August 18 and 25): Thrips continue to increase and the damage caused by them is quite severe.

#### A SCARABAEID (Dichromina dimidiata Burn.)

Arizona. T. P. Cassidy and T. C. Barber (August 1): This beetle was found

feeding in cotton blooms at Sawyer Ranch the past week. Injury to cotton blooms from this insect was first noted during July 1935, in the experimental cotton field located at this ranch, which is 25 miles southwest of Tucson. The 1935 infestation lasted for only about 10 days, the beetles disappearing from the field as suddenly as they came. (August 15): These beetles were found injuring cotton bolls in the experimental cotton at Fresnal on August 10.

## FOREST AND SHADE - TREE INSECTS

### SATIN MOTH (Stilpnotia salicis L.)

Connecticut. J. C. Schread (July 1): The satin moth has increased to alarming proportions in Bridgeport, where it is widespread throughout the city. Some trees are partially defoliated.

### GYPSY MOTH (Porthetria dispar L.)

Maine. H. B. Peirson (August): Gypsy moths on oak were very numerous in early August in central Maine, the moths laying their eggs being noticeable.

Connecticut. W. E. Britton (August 21): No defoliated trees noticeable in Connecticut. No unusually large infestations discovered.

### BROWN-TAIL MOTH (Nygmia phaeorrhoea Donovan.)

Maine. H. B. Peirson (August): Larvae and adults found in unusual numbers in Acadia National Park in July and August.

### FOREST TENT CATERPILLAR (Malacosoma disstria Hbn.)

Montana. A. L. Strand (August): Cottonwood trees near Livingston were completely defoliated by forest tent caterpillar early this season. Damage elsewhere has not been reported.

### WALNUT CATERPILLAR (Datana integerrima G. & R.)

Connecticut. E. P. Felt (August 24): The walnut caterpillar has been somewhat injurious to hickory foliage in the Danbury area.

Michigan. R. Hutson (August 24): Walnut datana has been numerous at Gobles, Vermontville, Paw Paw, DeWitt, and Lansing.

Mississippi. H. Gladney (August 24): Colonies of walnut caterpillars are scarce in Jackson and Harrison Counties.

### FALL WEBWORM (Hyphantria cunea Drury)

Vermont. H. L. Bailey (August 19): Fall webworm is scarce in Vermont this year.

Connecticut. W. E. Britton (August 21): Nests are scarce throughout the State, much more so than in the average season.

E. P. Felt (August 24): Recently-hatched caterpillars (H. textor Harr.) were observed feeding on dogwood at Stamford.

Ohio. T. H. Parks (August 25): Webs are conspicuous in the State forests of southeastern Ohio.

Tennessee. G. M. Bentley (August 16): The first appearance of the fall webworm was on a sycamore tree in Knoxville.

Mississippi. C. Lyle (August 24): The fall webworm has caused very light damage this season.

BAGWORM (Thyridopteryx ephemeraeformis Haw.)

Tennessee. G. M. Bentley (August 19): In comparison to other years the bagworm injury is fully 75 percent less throughout the State.

Alabama. J. M. Robinson (August 13): The bagworm was active on evergreens and deciduous trees at Alexander City, Auburn, Buffalo, Talladega, and Rogersville during July and August.

Mississippi. C. Lyle (August 24): Bagworms have become more noticeably destructive during the past month than earlier in the season.

Texas. F. L. Thomas (August 7): Bagworm was more abundant than usual throughout July on arborvitae and cedar at College Station. They have practically ceased feeding.

BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

Maine. H. B. Peirson (July 31): Belted beech scale found in Township 36 M. D. in Washington County on beech. This is a new locality record.

A CERAMBYCID (Xylotrechus quadrimaculatus Hald.)

New York. R. D. Glasgow (August 18): Has become seriously destructive to beech trees, particularly to beech hedges in parts of Westchester County. (Identified by K. F. Chamberlain.)

EUROPEAN BIRCH LEAF MINER (Fenusa pumila Klug.)

Maine. H. B. Peirson (August 10): Heavy infestation on small gray birch was found in Acadia National Park on August 10.

Connecticut. R. B. Friend (August 22): Very abundant throughout the State on gray and white birches.



ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

- England and New York. J. V. Schaffner, Jr. (August 25): Infestations of elm leaf beetle in the Northeastern States generally are somewhat lighter than in 1935. However, there are many localities in southern New Hampshire, Massachusetts, Connecticut, and eastern New York that have elms badly browned by the feeding of larvae. In nearly every instance the infestations seem to be extremely local, the infested trees being adjacent to buildings where adults had hibernated.
- New York. R. E. Horsey (August 15): Several infestations on American, Scotch, and other elms--on some trees quite severe-- in the towns of Penfield and Perinton near Rochester, as well as in the city were reported. Probably about the same as usual for the past few years. The majority of elms are little injured, although one variety of Scotch elm was found with every leaf skeletonized. Larvae from 3 to 5 mm in length were found on American elm on August 6. Probably second brood, as there was evidence of earlier feeding.
- Ohio. T. H. Parks (August 25): This insect has defoliated some English and Chinese elms and has fed freely on American elms in isolated areas of our larger cities. The second brood of beetles is now out.
- E. W. Mendenhall (August 11): Elm leaf beetle was found infesting English and Chinese elm trees on the west side of Columbus. Very bad on Chinese elm as well as other elms in Cincinnati and Springfield.
- Tennessee. G. M. Bentley (August 19): Elm leaf beetle has broken out in two places. The first, in Centinell Park, Nashville, reported previously the second on an American elm tree in Knoxville on August 3.
- Kentucky. M. L. Didlake (August 24): Adults injuring new growth of leaves after earlier defoliation by first-brood larvae.
- Washington. E. J. Newcomer (August 20): This beetle is thoroughly distributed in the Yakima Valley.

SMALLER EUROPEAN ELM BARK BEETLE (Scolytus multistriatus Marsham)

- Connecticut. E. P. Felt (August 24): The European elm bark beetle was observed in numbers entering sickly elms at Greenwich.

AN ELM APHID (Tuberculatus ulnifolii Monell)

- New York and New England. E. P. Felt (August 24): The elm aphid has been unusually abundant and prevalent in New York and southern New England.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

- New York. R. E. Horsey (August 15): European elm scale is quite a common pest and now noticeable on American, Scotch, and Wrede elms.

Ohio. E. W. Mendenhall (August 13): The European elm scale is quite serious in a block of elms in a nursery near Springfield, Clark County.

FIR

BALSAM FIR SAWYER (Monochamus marmorator Kby.)

Vermont. H. L. Bailey (August 19): Many fir balsam trees in Orleans County show dead twigs due to chewing of bark by the adult balsam sawyer.

LINDEN

LINDEN WART GALL (Cecidomyia verrucicola O. S.)

Massachusetts. E. P. Felt (August 24): The linden wart gall occurred very commonly on the lower leaves of lindens in the vicinity of Boston.

LINDEN BORER (Saperda vestita Say)

New York. E. P. Felt (August 24): The linden borer is reported as injurious to young linden trees at Great Neck, Long Island.

LOCUST

A BUPRESTID (Agrilus difficilis Gory)

Nebraska. M. H. Swenk (August 24): On July 24 some honeylocust trees in York County were reported infested with borers.

MOUNTAIN ASH

MOUNTAIN ASH SAWFLIES (Pristiphora spp.)

Vermont and Maine. J. V. Schaffner, Jr. (August 25): This European sawfly, P. geniculata Htg., on mountain ash seems to be present through the Northeastern States wherever its food plant is at all common. In the Green Mountain National Forest, the Middlebury College Forest, and the Battell Park, in Vermont, most of the mountain ash observed on August 4 and 5 had been defoliated, whether in groups or as individual trees scattered through the stands of spruce and mixed hardwoods. Defoliation by this insect also common in Acadia National Park, Mount Desert Island, Maine.

Maine. H. B. Peirson (August): Mountain ash sawfly (Pristiphora banksi Marl.) has been general over Maine. Many partly to completely defoliated trees.

OAK

TWIG PRUNER (Hypernallus villosus F.)

New England. E. P. Felt (August 24): The oak twig pruner is moderately

abundant in southern New England.

Michigan. R. Hutson (August 24): The oak twig pruner is reported from Davisburg, South Lyons, Grand Haven, Niles, Lansing, Shelby, Detroit, and Pentwater.

A LEAF MINER (Lithocolletis hamadryalla Clem.)

New York. E. P. Felt (August 24): The white blotch oak leaf miner has been quite abundant on oaks on the north shore of Long Island, producing a considerable disfiguration of the foliage.

OAK SPANGLE GALL (Cecidomyia poculum O. S.)

Connecticut. E. P. Felt (August 24): A dainty, attractive oak spangle gall has been extremely abundant on some white oaks in the Stamford area.

PINE

A PINE WEEVIL (Pissodes approximatus Hopk.)

Connecticut. G. H. Plumb (May 5): Grubs about 15 mm in length burrowing in the base of the trunk between the ground level and the root system on Scotch pine. The trees were completely girdled; the outer surface of the trunk merely a mass of pitch, hardened on the outside. The ground at the base of the trees covered with bits of broken bark and hardened pitch. Several of the trees were already dead and others were dying. A section of one of the trees was caged on May 5 and adults emerged on July 14.

WHITE-PINE WEEVIL (Pissodes strobi Peck)

Michigan. R. Hutson (August 24): The white pine weevil is numerous at Presque Isle, Fife Lake, East Tawas, Lansing, and Fennville, on all of its hosts.

A CHRYSOMELID (Glyptoscelis pubescens F.)

New York. W. E. Blauvelt (May 26): Was found on pine in a nursery at East Patchogue, Long Island.

NANTUCKET PINE SHOOT MOTH (Rhyacionia frustrana Comst.)

New York. E. P. Felt (August 24): The Nantucket pine moth was reported as injurious to white pine shoots on Long Island.

PINE NEEDLE SCALE (Chionaspis pinifoliae Charb.)

Ohio. E. W. Mendenhall (August 9): The pine needle scale is quite bad on several of the pine varieties in a nursery at Carroll, Fairfield County.



POPLAR

POPLAR AND WILLOW BORER (Cryptorhynchus lapathi L.)

Michigan. R. Hutson (August 24): Poplar borer is numerous about Sault Sainte Marie.

Idaho. J. C. Evenden (August 5): C. lapathi, which was first recorded in this locality some 5 years ago, has spread over most of the territory surrounding Coeur d'Alene and has perhaps a much wider distribution.

POPLAR SAWFLY (Trichiocampus viminalis Fall.)

Connecticut. J. C. Schroad (August 20): The Carolina poplars in the city of Bridgeport are, with a few exceptions, infested with the above-mentioned sawfly and in many instances the trees have been practically stripped of their foliage. This is the first year this pest has been abundant enough to attract attention.

SPRUCE

A GEOMETRID (Macaria granitata Guen.)

Maine. H. B. Peirson (August): Moths were found commonly over the State on spruce between June 1 and July 18.

SPRUCE BUDWORM (Cacoecia funiferana Clem.)

Minnesota. A. G. Bugles (August): Spruce budworm damaging jack pine in northeastern Minnesota in St. Louis, Hubbard, and Crow Wing Counties.

TULIPTREE

AN APHID (Macrosiphum liriodendri Monell)

New England and New York. E. P. Felt (August 24): The tuliptree aphid has been unusually abundant and prevalent in southern New England and in New York.

WILLOW

EUROPEAN WILLOW LEAF BEETLE (Flaviodora versicolora Leich.)

New England. J. V. Schaffner, Jr. (August 25): The feeding by the imported willow leaf beetle is very noticeable in many New England localities. Recently infestations were noticed on willow east as far as Bar Harbor in Maine and northwest as far as Keene, N. Y.

Maine. H. B. Peirson (August 4): Very light presence of imported willow leaf beetle found at Bath.

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

A PARASITIC WASP (Scolia dubia Say)

District of Columbia. E. A. Back (August 26): This wasp was found to be very numerous, resting on evergreens and flying over a lawn in the northwestern part of the city on August 24. It has been abundant about 10 days. The wasp was not found flying over neighboring premises.

SPINDLE WORM (Achatodes zeae Harr.)

Michigan. R. Hutson (August 24): Spindle worms are fairly common in columbine and dahlia at East Lansing.

CYCLAMEN MITE (Tarsonemus pallidus Banks)

Maine. H. B. Peirson (July 23): On this date the cyclamen mite was heavy on larkspur, or delphinium, at Winthrop, causing blackening of flower-bud parts and distortion of foliage.

ALDER

ALDER FLEA BEETLE (Altica binarginata Say)

Maine. H. B. Peirson (August): Alder flea beetle caused severe browning in many growths of alder in eastern and central Maine during July and August.

J. V. Schaffner, Jr. (August 25): Throughout eastern Maine the foliage of speckled alder is badly skeletonized.

Vermont. H. L. Bailey (August 19): Alder flea beetle has been very abundant in sections of Essex County, including Ferdinand and Warner's Grant. Leaves completely skeletonized and many fallen to the ground on August 14.

New York. J. V. Schaffner, Jr. (August 25): Through the region of the Adirondacks in New York the foliage of speckled alder is badly skeletonized.

Idaho. J. C. Evenden (July 29): There is a rather severe outbreak at Ashtor Targhee National Forest, which will no doubt result in the defoliation of a large percentage of the willow shrubs in that locality. First record in this district.

ARBORVITAE

ARBORVITAE LEAF MINER (Argyresthia thuiella Pack.)

New York. R. D. Glasgow (August 18): One nursery in the lower Hudson Valley is reported to have removed and destroyed several score of large arborvitae trees that had been rendered worthless by the arborvitae leaf mine.

DOGWOOD

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Connecticut. E. P. Felt (August 24): The red-humped apple caterpillars are somewhat injurious to flowering dogwood foliage at Stamford.

CECROPIA MOTH (Platysania cecropia L.)

Connecticut. E. P. Felt (August 24): The cecropia caterpillar was observed feeding on the foliage of flowering dogwood at Stamford.

EUONYMUS

EUONYMUS SCALE (Chionaspis eucyni Const.)

Alabama. J. M. Robinson (August 13): The euonymus scale is very abundant on euonymus, killing many of the twigs.

Mississippi. C. Lyle (August 24): Specimens of euonymus scale together with complaints, were received from Canton, Columbia, Terry, and Indianola, late in July and in August.

GLADIOLI

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Ohio. E. W. Mendenhall (August 3): Gladiolus thrips are slightly abundant on gladioli at Bowling Green, Wood County.

HAWTHORN

A LACEBUG (Corythucha cydoniae Fitch)

Michigan. R. Hutson (August 24): The quince lacebug is numerous on hawthorn about Springport.

Mississippi. C. Lyle (August 24): The lace bug was causing injury to hawthorn at Kosciusko on July 23.

JAPANESE LANTERN

THREE-LINED POTATO BEETLE (Lema trilineata Oliv.)

Vermont. H. L. Bailey (August 19): Old-fashioned potato beetles were very abundant at Montpelier, particularly on Japanese lantern plant, on August 10.



MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

New York. R. E. Horsey (August 15): A badly infested large Kobus magnolia and a Star magnolia with considerable magnolia scale were found on this date at Rochester. Less scale than last year.

NARCISSUS

BULB MITE (Rhizoglyphus hyacinthi Bdv.)

Mississippi. C. Lyle (August 24): Bulb mite was present on bulbs received from New Albany on August 11.

PRIVET

LILAC LEAF MINER (Gracilaria syringella F.)

New York. E. P. Felt (August 24): The lilac leaf miner was found mining rather commonly the privet foliage at Southampton, Long Island.

ROSE

A ROSE TWIG GIRDLER (Agilus communis rubicola Perrin)

Connecticut. M. P. Zappe (August 21): This summer the insect is rather scarce and has only been reported a few times by the nursery inspectors. In other years it was reported from nearly every nursery that had susceptible roses.

SUNFLOWER

SUNFLOWER BEETLE (Zygogramma exclamationis F.)

New Jersey. C. E. Mickel (August 11): H. H. Shepherd just returned from a trip through the East and turned over to me two specimens which he collected on sunflower at Vineland, N. J., on July 24. He reports that the larvae were working in sunflower buds. This is a western species known from Kansas, Arizona, and Montana.

WATERLILY

WATERLILY LEAF BEETLE (Galerucella nymphaeae L.)

Connecticut. E. A. Back (August 26): On August 16 the pond lily chrysomelid was found abundant in the egg, larval, pupal, and adult stages at North Windham. The species was defacing the foliage of the white pond lily.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

MAN

MOSQUITOES (*Culicinae*)

Maryland. F. C. Bishopp (August): Anopheles punctipennis Say has been quite annoying to residents of Silver Spring and vicinity during the past few weeks.

Oregon. C. M. Gjullin (July 31): A mosquito survey of the locality in and around Prineville showed A. maculipennis Meig. to be present in large numbers. It was practically the only species causing annoyance to the residents of the locality during the evenings. Larvae of this species were numerous in irrigation ditches and along the margins of sluggish streams.

SAND FLIES (*Culicoides* spp.)

Georgia. J. B. Hull (August 26): During July sand flies have caused very little annoyance in the vicinity of Savannah. Some C. dovei Hall were collected from recovery cages but only five specimens of C. canithorax Hoffn. were taken.

Florida. J. B. Hull (August 26): All reports from the east coast of Florida during July state that sand flies were worse than ever before. More correspondence in regard to sand-fly annoyance and requests for aid were received during July than at any time previously.

HUMAN FLEA (Pulex irritans L.)

Maryland. F. C. Bishopp (August 1): An unusually severe outbreak occurring on a farm near Bethesda was found to be caused by the human flea, breeding in large numbers in hog pens. The farmer's house later became heavily infested as a result of workmen bringing in the insects on their clothing. This is not common in the eastern part of the United States.

HOUSE CRICKET (Gryllus domesticus L.)

Virginia. E. A. Back (August 26): From May to August 22 the house cricket was abundant in and about a feed mill at Sunset Hills, where the crickets were making a nuisance of themselves by crawling into the machinery at night, only to be jarred into the feed stream when the mill was started, thus being conveyed to the feed containers. Crickets are reported as having been abundant in the same mill during 1935. A huge pile of corn-cobs, in the rear of the plant, accumulated during the past several years, and a damp, uncleaned cellar are thought to furnish conditions favorable to increase.

Mississippi. C. Lyle (August 24): Crickets were entering houses in Forest and seriously damaging clothing according to a complaint received on July 30. They were also noticed in houses at State College during August.

FIELD CRICKET (Gryllus assinilis F.)

North Dakota. F. Gray Butcher (August 18): Black field crickets have been much more abundant in recent weeks, but there has been little injury from them.

Nebraska. M. H. Swenk (August 24): A complaint of annoyance by crickets in the basement of a Buffalo County home was received on July 22.

Kansas. H. R. Bryson (August 23): The common black field crickets are more numerous this fall than usual. They are causing considerable annoyance in basements and houses. A heavy population was observed along a half-mile stretch in Mitchell County on August 6.

BLOODSUCKING CONENOSE (Triatoma sanguisuga Lec.)

Mississippi. C. Lyle (August): A specimen was collected in a home at New Albany on August 11. One killed was found full of blood and an occupant of the room had an inflamed place on the arm, probably due to the bite of this insect.

ANTS (Formicidae)

Mississippi. C. Lyle (August 24): Numerous complaints of ants have been received throughout the month. Solenopsis xyloni McCook was causing serious trouble. The Argentine ant (Iridomyrmex humilis Mayr) has been the source of numerous complaints also, while a few correspondents have sent in the tiny black ant (Monomorium minimum Buckl.).

Nebraska. M. H. Swenk (August 24): From Hall County on August 11 came the complaint that the carpenter ant (Camponotus herculeanus pennsylvanicus Dog.) was abundant on elm trees in that locality.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Maryland, Virginia, and District of Columbia. F. C. Bishopp (August 15): Ticks decreased rapidly after the first week of August and infestations on dogs had practically stopped after the 15th in Maryland, Virginia, and the District of Columbia.

Mississippi. C. Lyle (August 24): The American dog tick was collected on cows by a correspondent at Purvis on July 31, who reported that ticks are numerous on dogs, hogs, and cows in the southern part of Forrest County.



BROWN DOG TICK (Rhipicephalus sanguineus Latr.)

Maryland. F. C. Bishopp (August 20): Several heavy infestations of dogs and houses have been reported from Baltimore by some of the large insect-exterminating companies in that city.

CATTLE

SCREWORM (Cochliomyia americana C. & P.)

United States. W. E. Dove (August 24): In Florida and in some of the bordering counties of Georgia there was a low incidence, but the infestations were well distributed. The rainfall and temperatures in these wooded areas were favorable for infestations, but the small number of untreated injuries present did not permit the insects to increase. Cases were reported principally from navels of young animals and from tick bites, rather than from surgical operations and such preventable injuries. From August 1 to 21 there were 2,475 cases reported from Florida, 42 from Georgia, 16 from Alabama, 13 from Louisiana, 4 from Mississippi, and 9 from South Carolina. The reported cases included those caused by maggots of blowflies, as well as from screwworms. The primary screwworm occurred in most of the counties of Florida and in two localities in Georgia. Specimens obtained from Lowndes County on July 29 and from Effingham County on August 13 were identified as C. americana. In South Carolina, Alabama, Mississippi, and Louisiana C. americana larvae were not found among specimens collected from wounds. During the past 3 weeks there were 21,456 cases reported from Texas, 149 from Arizona, 21 from California, 7,659 from New Mexico, and 170 from Oklahoma. Following shearing there was an abrupt increase to 5,367 cases for 1 week. For the week ending August 21 there were 1,398 cases in this State. The cases reported from Texas include from 74 to 87 counties. In California true screwworms previously were reported only from the southern part of the State. In August they were encountered in Tulare County. This spread is attributed to the natural movement of animals to the lower lands and to the beet fields and stubbles of clover. At the stockyards in East St. Louis larvae of C. americana were obtained from injured animals in nine instances. The infestations were promptly treated before the animals were reshipped. Three infestations were found in calves from Fort Worth, Tex., which were consigned to the East. Two infestations were found in the stockyards at Kansas City, Mo., and were treated promptly. Local infestations in Kansas were encountered in Mabaunsee and Greenwood Counties. In both of these counties efforts were made to stamp out the introductions and there is no evidence of other cases. All animals shipped to the Southeastern States are being examined promptly upon arrival. It is felt that reintroductions of the pest will be prevented from causing serious trouble.

A BLOWFLY (Paralucilia fulvipes Macq.)

Arizona. C. C. Deenier (August 26): A number of specimens have been taken in fly traps in several localities in Arizona. Its occurrence in Arizona appears to be a new locality record for this species, as heretofore it has been considered as being restricted in the United States

to California. Present information on its distribution in Arizona indicates that it is more abundant in the higher altitudes. Although the species is primarily a carcass breeder, there is some evidence that it is involved in causing myiasis in animals.

HORN FLY (Haematobia irritans L.)

South Carolina. W. E. Dove (August 21): A heavy infestation of horn flies is present in certain localities on Johns Island, some animals having approximately 3,000 flies feeding on their backs.

GULF COAST TICK (Amblyomma maculatum Koch)

Mississippi. C. Lyle (August 24): The Gulf coast tick was collected on cows by a correspondent at Purvis on July 31, with the report that ticks are numerous on dogs, hogs, and cows in the southern part of Forrest County.

M. Brunson (August 26): Heavy infestations of all classes of livestock were reported from the northwestern part of Hancock County.

H O U S E H O L D   A N D   S T O R E D - P R O D U C T S

I N S E C T S

Termites (Reticulitermes spp.)

Michigan. R. Hutson (August 24): Termites, R. flavipes Kol., have been reported as infesting houses in Lansing, and an infestation of potatoes in the field was discovered at Plainwell.

Minnesota. A. G. Ruggles (August 22): R. tibialis Banks found doing damage to timbers and floors of many houses in the southwestern part of the town of Luverne, in Rock County.

CIGARETTE BEETLE (Lasioderma serricorne L.)

District of Columbia. E. A. Back (August 26): During the first 2 weeks of August this species was infesting the straw upholstery of furniture.

## THE MORE IMPORTANT RECORDS FOR SEPTEMBER 1936

Grasshoppers were dying off rapidly during the last week of September. A heavy oviposition was observed over most of the territory infested.

The fall armyworm occurred in outbreak numbers from Virginia and Tennessee southward to the Gulf.

The wheat midge in the Payallup Valley of Washington has been found as far south as Payallup, nearly 50 miles south of any previously known infested territory. In the older infested territory as high as 50 percent of the wheat kernels were destroyed.

Wheat stem sawflies have been abundant this season in the Middle Atlantic and East Central States, the infestation in Ohio being especially heavy.

Corn ear worm, which has been unusually scarce throughout the season, developed rapidly during September from New England and Iowa to North Carolina and Tennessee. Late corn and tomatoes were seriously damaged in many sections. This insect was also reported as doing commercial damage to tomatoes in California and Mississippi, and to lima beans in North Carolina.

European corn borer has been found for the first time in Norfolk and Princess Anne Counties, on the mainland of Virginia.

Chinch bug was moving into winter quarters during the last 2 weeks of September.

Alfalfa caterpillar was reported seriously damaging sweetpotatoes in Tennessee and doing heavy damage to alfalfa in Colorado and California.

The cotton leaf worm moths were reported as seriously damaging late peaches in Missouri and flights of this insect were reported from Connecticut.

Heavy late boll weevil infestations were reported along the Atlantic seaboard and considerable damage was being done in late fields.

Defoliation of cotton by leaf worm was quite general throughout the Cotton Belt. Late cotton also suffered from bollworm depredations.

A serious outbreak of the eastern spruce beetle was reported from the Green Mountain National Forest in Vermont. Over 90 percent of the merchantable spruce in limited areas has been killed.



GENERAL FEEDERS

GRASSHOPPERS (Acrididae)

- Indiana. C. M. Packard and associates (September 18): Adults of Melanoplus mexicanus Sauss., M. differentialis Thos., and M. femur-rubrum Deg. are from common to abundant everywhere around Lafayette. While working in experimental plots and wheat stubble fields noted some eggs in soil. Eggs have been unusually noticeable on automobiles, where hoppers have smashed against them.
- Illinois. W. P. Flint (September 24): Egg laying has been general for about 3 weeks and is still going on. Weather conditions have been very favorable for the hoppers during the egg-laying period. Hoppers are now dying very rapidly, especially the differential grasshopper.
- Missouri. L. Haseman (September 25): Grasshoppers have been ovipositing now for some time in central Missouri but the peak of egg laying has not been reached. Adults are much less abundant over most of the State than during the summer, but indications are that a good supply of eggs is being deposited. Hoppers are damaging the margins of alfalfa and fall-seeded small grains. About half of the grasshoppers at this season are M. differentialis, the other half being about equal numbers of M. femur-rubrum and M. mexicanus.
- Tennessee. G. M. Bentley (September 2): J. C. Moser reports large numbers of M. femur-rubrum in pastures in western Tennessee.
- Alabama. J. M. Robinson (September 25): Adult grasshoppers are attracting attention at Bessemer.
- Mississippi. C. Lyle (September 24): Grasshoppers were stripping about 200 acres of soybeans at Cruger on September 14. Apparently most of the damage was being done by M. mexicanus. Dissosteira carolina L., M. differentialis, and M. femur-rubrum were also collected.
- Nebraska. M. H. Swenk (September 23): A delayed late-August and September hatch of grasshoppers, principally of the two-striped grasshopper (M. bivittatus Say), has caused some apprehension among farmers in Cass, Saunders, Gage, York, Nuckolls, and adjacent counties.
- Oklahoma. C. F. Stiles (September 25): M. differentialis still quite numerous along creeks and fence rows and in some parts of the State is damaging alfalfa. Most of the other species numerous earlier in the season have died.
- Colorado. S. C. McCampbell (September 21): J. R. Parker and R. L. Shotwell were with me last week investigating a heavy infestation of Dissosteira longipennis Thos. (commonly known as the long-winged locust of the plains), involving 100 square miles of southeastern Colorado. Part of this area is heavily infested with eggs, as many as 1,600 per square foot having been estimated in some parts of the fields.

MORMON CRICKET (Anabrus simplex Hald.)

Nevada. D. F. Barnes (July 28): While driving west through Nevada on July 18, I crossed a heavy infestation of Mormon crickets extending from about 10 miles east to about 10 miles west of Elko. On the west side of Elko control work was being carried on. At one point where the barriers had been removed there was a strip of dead crickets from 14 to 16 inches wide and several miles long. The infestation at Emigrant Pass between Carlin and Dunphy was lighter than in the latter part of May, but individuals were still crossing the road. The infestations constituted a motor hazard.

G. G. Schweis (September 14): Specimens of a wasp found attacking Mormon crickets in eastern Nevada were identified by G. A. Sandhouse as Chlorion laeviventris Cress.

FIELD CRICKET (Gryllus assimilis F.)

Iowa. H. E. Jaques (September 23): Carroll County reports moderately heavy losses from black crickets.

Texas. O. G. Babcock (September 20): Black crickets following heavy rains were very numerous at Austin about the business buildings at night, wherever the store lights were on. They were so numerous they could be swept up into piles and scooped up. The sidewalks were covered at night. A few were about at Sonora.

EUROPEAN EARWIG (Forficula auricularia L.)

New York. E. P. Felt (September 25): The European earwig was found to be well established at Roslyn, L. I., on September 9.

CUTWORMS (Noctuidae)

Tennessee. E. W. Howe (September): There has been a serious outbreak of several species of cutworms at Clarksville during August. Tobacco and corn on low ground, which had remained comparatively damp during the drought, were seriously infested. Apparently the moths flew to the greenest herbage available and laid their eggs. One tobacco field suffered a 50-percent loss in stand. Two areas in large cornfields suffered a loss of about 65 percent, but over the entire acreage involved, the loss was not over 6 percent. Most damage occurred prior to September 15, but some corn was damaged at the end of the month. In attacking corn the larvae first defoliated crabgrass and other low vegetation, then climbed the cornstalks, fed on the leaves (frequently leaving only the midribs), and ate the silk prior to fertilization.

FALL ARMYWORM (Laphygma frugiperda S. & A.)

Virginia. H. G. Walker (September 25): A very heavy outbreak of the fall armyworm occurred between July 20 and August 1, when it completely destroyed nearly all of the millet and Sudan-grass fields and injured



some cornfields in the Norfolk district. From August 15 to 31 they have been present and have done considerable damage in late-planted corn.

North Carolina. C. H. Brannon (September 10): Damage to corn reported over a wide area.

Georgia. T. L. Bissell (August 28): The fall armyworm is very abundant on grass at Experiment. (September 2): The fall armyworm is ruining a large field of corn at the Experiment station. (September 10): Holes are being eaten in pimiento pepper fruit at Vaughn. (September 14): A study was made of injury by fall armyworm and corn ear worm (Heliothis obsoleta F.) in late field corn at Experiment. Of 435 ears, 426 were infested. In these ears were found 337 fall armyworms and 157 corn ear worms. It was estimated that 39.2 percent of the grain had been ruined, though the injury to the crop was greater because many ears failed to develop.

G. F. Moznette (September 15): The fall armyworm has been quite prevalent in southern Georgia in fields of cotton, kudzu, and Johnson grass, and has caused considerable damage.

Florida. J. R. Watson (September 24): A few complaints have been received of the depredations of the fall armyworm, although it is not as numerous as it has been in other years.

Tennessee. G. M. Bentley (September 3): The grassworm has been damaging corn in Cheatham and Cannon Counties. (September 14): Lima beans at Tellico Plains, Monroe County, were also damaged. Estimated loss to the bean crop was \$5,000.

Alabama. J. M. Robinson (September 25): During the first week in September the fall armyworm was reported as active on 150 acres of soybeans to be used for seed in Wilcox County.

Mississippi. C. Lyle (September 24): Fall armyworm was causing serious injury to a lawn at Meridian on August 28.

#### VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

South Carolina. F. F. Bondy (September 5): Grass worms and the soybean worm, probably A. gemmatilis, are doing damage in parts of Darlington County. (September 26): The southern grass worm and the soybean worm are doing serious damage to soybeans, and farmers are inquiring about control measures.

#### WHITE GRUBS (Phyllophaga spp.)

Kentucky. W. A. Price (September 25): Digging records show that white grubs have been much reduced in numbers in the vicinity of Lexington during the past 2 months.

Minnesota. A. G. Rungles and assistants (September): White grubs are very



abundant in Winona, Freeborn, and Mower Counties in southern Minnesota, and in Crow Wing and Carlton Counties in east-central part of the State.

GREEN JUNE BEETLE (Cotinis nitida L.)

Virginia. H. G. Walker (September 25): Nearly full-grown grubs are moderately abundant in some spinach fields at Norfolk, where they have caused a small amount of damage by burrowing under and killing the young spinach.

ASIATIC GARDEN BEETLE (Autoserica castanea Arrow)

Connecticut. E. P. Felt (September 23): Grubs caused appreciable injury to snapdragon plants in a Stamford greenhouse, the soil in which the plants were growing having been brought in recently.

A WEEVIL (Naupactus leucoloma Boh.)

Florida and Alabama. J. R. Watson (September 24): A weevil new to North America, identified by L. L. Buchanan as N. leucoloma, appeared this summer in the northern part of Walton County, Fla., and adjacent areas of Alabama. According to the county agent, it did much damage to peanuts and some to cotton and other plants.

C E R E A L   A N D   F O R A G E - C R O P   I N S E C T S

WHEAT

HESSIAN FLY (Phytophaga destructor Say)

Ohio. T. H. Parks (September 26): An examination of volunteer and early sown wheat on September 21 showed few eggs present. As very few of the aestivating insects remain alive, we do not expect any serious injury this fall, even to the early sown wheat.

Indiana. C. M. Packard and associates (September 18): Dissections of western-Indiana material indicate summer survival of puparia in stubble to be from 1 to 20 percent, depending upon local conditions. Considerable pupation now in progress. The mid-August rains sprouted much volunteer wheat in the vicinity of Lafayette and caused some fly emergence. A few eggs noted September 8 on volunteer, some already hatched. In two fields seen yesterday near Delphi, much of the volunteer was already showing infestation, mainly from small to mature larvae, with a few new puparia.

Illinois. W. P. Flint (September 24): Early fall rains have caused emergence of adults and a growth of volunteer wheat. This will, on the whole, be favorable to the sowing of a commercial wheat crop, as most of the flies will be out before the normal date of seeding.

Missouri. L. Haseman (September 25): We will have considerable early seeded wheat and in most sections of the State we are finding sufficient live

flaxseeds to cause serious concern. A considerable number of the flaxseeds in central Missouri are showing parasitization and a great many others were probably destroyed by the heat.

Nebraska. M. H. Swenk (September 23): The hessian fly is at such a low ebb of population that no observations are being made of the sowing date.

BLACK GRAIN STEM SAWFLY (Trachelus tabidus F.)  
EUROPEAN WHEAT STEM SAWFLY (Cephus pygmaeus L.)

General. J. S. Houser, E. J. Udine, and J. S. Pinckney (August): Surveys made this summer for wheat stem sawflies showed T. tabidus more or less abundant in wheat fields over a wide territory, including most of Pennsylvania, Maryland, Delaware, Virginia, and part of eastern Ohio. The infestation was by far the heaviest in eastern Ohio, where it was alarmingly abundant in several counties. In that State infestations have advanced considerably farther westward since last year. Surveys in parts of Virginia and North Carolina showed none south of Campbell County. C. pygmaeus was present, as usual, in western New York and was increasing in eastern Pennsylvania.

CORN

CORN EAR WORM (Heliothis obsoleta F.)

Massachusetts. A. I. Bourne (September 24): The corn ear worm has been much less abundant than usual, and no complaints of severe damage have been received. A very slight amount of it was noted in early maturing corn in the vicinity of Springfield.

Connecticut. N. Turner (September 21): The second brood infested about 17 percent of the sweet corn at Mt. Carmel farm, about 6 percent less than in 1935. Small larvae are still present.

Indiana. E. V. Walter (September 18): A heavy deposition of eggs began at Lafayette about August 26 and has continued to date. Nearly every corn ear is infested with from one to six larvae. These are in all stages of maturity.

Illinois. W. P. Flint (September 24): Little infestation up to the first of September. Since that time a rather heavy flight of moths has occurred and in fields of late corn nearly 100 percent of the ears are infested.

Kentucky. W. A. Price (September 25): Corn ear worms are unusually abundant in late corn and tomatoes in the vicinities of Shelbyville, Lexington, and Elizabethtown. In several patches of late corn the leaves, tassels, and stalks are being riddled.

Iowa. H. E. Jaques (September 23): The corn ear worm is strongly contesting with the grasshoppers for first place. The drought has made their damage a serious matter.



Missouri. L. Haseman (September 25): With practically all of the corn crop being destroyed by the drought and very little forming even nubbins, the corn ear worm is less abundant than for many years. Some late green tomatoes are being injured.

Tennessee. G. M. Bentley (September 3): Corn ear worm is attacking millet and the pods of soybeans and cowpeas in Cannon County. Heavy injury to corn in bottom lands in western Tennessee. Also reported damaging sweet corn in Sevier County at least 75 percent. In some cases practically none of the corn can be used for canning.

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Massachusetts. A. I. Bourne (September 24): The European corn borer has caused rather less damage than usual, particularly in the eastern part of the State where the infestation is of longer standing. This is based on the number of damaged ears, rather than on stalk infestation. There were instances of heavy infestation in market-garden areas in the Connecticut Valley.

Connecticut. N. Turner (September 21): Second-generation infestation on sweet corn at Mt. Carmel farm was about 20 percent less than last year. About 30 percent of the ears are infested. Infestation in dahlias was at least as heavy as in 1935. Untreated plants are entirely ruined.

Virginia. H. G. Walker and L. D. Anderson (September 26): The European corn borer has been found for the first time in several cornfields near the Chesapeake Bay in Norfolk and Princess Anne Counties, but none was found more than 5 miles inland.

CHINCH BUG (Blissus leucopterus Say)

Ohio. T. H. Parks (September 26): Some farmers in northern Ohio are reporting chinch bugs present in plentiful numbers on the wagons as they fill their silos. No serious damage was done to the corn.

Indiana. C. Benton (September 18): Mid-August surveys in standing corn showed the following average numbers of chinch bugs per stalk, by counties: Benton, 27; Tippecanoe, 46; Clinton, 8; and Tipton, 3. In Tippecanoe County second-brood bugs were still abundant in corn on September 17, being mainly from third instar to adult. They were also abundant on young timothy in a wheat-stubble field. Examinations of bunch grasses on September 17 showed some accumulation of adults in hibernation quarters since September 1, when practically none were present in bunch grasses.

Illinois. W. P. Flint (September 24): Chinch bug development was retarded somewhat by the extremely hot weather early in August. Development was normal during the latter part of August and first part of September. There is a heavy infestation over all the west-central part of Illinois, extending south below the latitude of St. Louis, Mo. The infestation is lighter in the eastern part of the State. Large numbers of bugs have



been flying to winter quarters since about September 10.

Missouri. L. Haseman (September 25): The carry-over of chinch bugs seems to be light, except in a few isolated localities, where farmers are reporting that they are abundant on late corn and sorghum.

Nebraska. M. H. Swenk (September 23): Chinch bugs were reported as present in greater than normal numbers in the cornfields in Richardson and Nemaha Counties from August 20 to September 20.

DESERT CORN FLEA BEETLE (Chaetocnema ectypa Horn)

California. H. J. Ryan (September 10): Three acres of popcorn out of a 5-acre field were destroyed in Los Angeles County.

ALFALFA

ALFALFA CATERPILLAR (Eurymus eurytheme Bdv.)

Tennessee. E. W. Howe (September): Alfalfa caterpillars seriously damaged sweetpotato foliage at Clarksville during the latter part of the month.

Colorado. S. C. McCampbell (September 21): We have had an abundance of the alfalfa caterpillar. In the lower Arkansas Valley during the past 30 days considerable injury has resulted to alfalfa.

California. H. C. Donohoe and C. K. Fisher (August 27): Alfalfa fields in Fresno County have been heavily infested with adults for several days. Several fields have been noted within the last 2 days containing the greatest adult infestations the writers have ever noted.

C. C. Wilson (September 4): The alfalfa caterpillar, which usually builds up to severe damaging proportions on the fourth and fifth cuttings of alfalfa, has again destroyed large acreages of hay in Sacramento County. Damage was severe on approximately 1,000 acres, causing a reduction of 1 ton per acre. The monetary loss over an area of 100 square miles was estimated to be approximately \$15,000, while hay buyers estimated 10 percent loss for the county. Bacterial wilt attacked the larvae, but conditions favoring this disease came too late to avert the damage.

FRUIT INSECTS

SAN JOSE SCALE (Aspidictus perniciosus Comst.)

Georgia. O. I. Snapp (September 14): Crawlers are now beginning to set up on peach twigs in numbers at Fort Valley. There were very few crawlers on peach trees until September. The infestation usually builds up rapidly on peach trees in Georgia during this month.

C. H. Alden (September 24): A light, general infestation noted throughout the peach- and apple-growing sections around Cornelia, but few heavy infestations found.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Virginia. W. J. Schoene (September 24): The third-brood codling moth has been unusually large this year and has caused considerable injury in orchards where an abbreviated schedule has been followed.

Georgia. C. H. Alden (September 24): Moth emergence about over; practically none caught in the bait pots during the past 2 weeks. Larvae in apples are about full fed and those leaving are spinning up winter cases. The insect has been no more abundant this season than usual but appears to be worse, because the State has less than one-third of a normal crop of apples.

Ohio. T. H. Parks (September 26): Sixty-three commercial apple orchards, located in all parts of the State, checked for insect and disease blemishes during the latter half of September, showed an average of 6 percent of the fruits carrying stings or entrances of larvae. The orchards ranged from 69 percent worm injury to 0.01 percent. Only a few orchards have a serious problem. The percentage of insect- and disease-free fruit in these orchards averaged 89.1. Most of the orchards in the east side of the State received no spray for the second generation of worms. Many in Ottawa and Lawrence Counties received five cover sprays.

Illinois. W. P. Flint (September 24): Codling moths are still hatching and entering apples in small numbers. The infestation in southern Illinois is one of the heaviest that ever occurred in that region. Many orchards in western Illinois are also heavily infested. Apple picking is more than half over in all the important orchard sections of the State. The situation at present points to a very heavy carry-over of worms next year.

Minnesota. A. G. Rungles and assistants (August 29): Codling moth very abundant in Freeborn County.

Missouri. L. Haseman (September 25): In southern Missouri late worms continued to enter up to the middle of the month. In central Missouri the last moths were taken in the bait traps on September 15. The carry-over of

worms in Missouri will be lighter than for many years past.

Washington. E. J. Newcomer (September 22): Cool weather early in September prevented a heavy late emergence of moths in the Yakima Valley; the high point from August 12 to 18 was the peak. There are as a consequence fewer late worms in the fruit.

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Mississippi. C. Lyle (September 24): A colony of worms on apple foliage was sent in from Magnolia on September 15.

APPLE LEAFHOPPERS (Cicadellidae)

Massachusetts. A. I. Bourne (September 24): The late brood of the white apple leafhopper, Typhlocyba pomaria McAtee, is not more than normally abundant; in comparatively few orchards has there been any serious spotting of the leaves or fruit.

Connecticut. P. Garman (September 22): Infestation of white apple leafhopper is from moderate to heavy in New Haven County.

Virginia. W. J. Schoene (September 24): The white apple leafhopper is generally present in apple orchards and is causing annoyance to pickers and some loss due to the specking of the fruit.

Illinois. W. P. Flint (September 24): Apple leafhoppers have been extremely abundant in nearly all commercial orchards in western and southern Illinois.

Kentucky. W. A. Price (September 25): Adult apple leafhoppers, principally Erythroneura cones maculata Gill., are present in great numbers in apple orchards in central Kentucky and have caused considerable defoliation.

EUROPEAN RED MITE (Paratetranychus pilosus C. & F.)

Massachusetts. A. I. Bourne (September 24): There is a very extensive bronzing of foliage in many of the larger apple orchards of the State resulting from late-season abundance of European red mite. During the latter part of the summer more red mites were present generally throughout the orchards than for many years.

PEACH

COTTON LEAF WORM (Alabama argillacea Hbn.)

Missouri. W. F. Turner (September 25): One peach grower in Scott County has a considerable planting of Henrietta peaches, which are just getting ripe. Adults of the cotton caterpillar have ruined most of the fruit by feeding on it. This grower states that he has the same experience every 3 or 4 years and that he is pulling up the entire block this year.



Hereafter, he will grow nothing that ripens after Elbertas.

PEACH BORER (Conopia exitiosa Say)

Georgia. O. I. Snapp (September 19): The peak of moth emergence occurred at Fort Valley during the first week of September, which is earlier than usual. This was expected on account of the unusually early pupation season this year. Observations during the last month indicate that infestation was heavier than that of 1935.

C. H. Alden (September 24): Peach tree borer infestation is not as heavy as in 1935 at Thomaston and Cornelia.

PEACH TWIG BORER (Anarsia lineatella Zell.)

California. D. F. Barnes (August 3): General reports indicate a rather heavy infestation in peaches in Fresno County.

ORIENTAL FRUIT MOTH (Grapholitha molesta Busck)

Connecticut. P. Garman (September 22): Infestation of oriental fruit moth is heavy in some orchards in New Haven County. Infestations in Elbertas are estimated at from 30 to 50 percent. In other localities the infestation has been light, not over 10 percent.

Ohio. T. H. Parks (September 23): This insect was much more injurious to peaches along Lake Erie than for several years. The Elberta crop was badly infested in some orchards.

Tennessee. G. M. Bentley (September 3): Fruit moth injury loss on peaches than usual in western Tennessee as reported by J. C. Moser.

PLUM CURCULIO (Conotrachelus nenuphar Hbst.)

Georgia. O. I. Snapp (September 10): Second-generation adults are now emerging in numbers in Elberta peach orchards at Fort Valley. There are no adults on the trees of varieties that matured fruit before the deposition of second-generation eggs. First-generation adults have not been found on peach trees during the last month.

Tennessee. G. M. Bentley (September 3): Curculio injury loss on peaches this year than usual in western Tennessee (J. C. Moser).

GRAPE

GRAPE BERRY MOTH (Polychrosis viteana Clem.)

Ohio. T. H. Parks (September 23): The grape berry moth is quite serious in commercial vineyards of Columbiana County. Some growers will have from 25 to 30 percent loss of their Concord grapes.

PECAN

WALNUT CATERPILLAR (Datana integerrima G. & R.)

Georgia. G. F. Moynette (September 15): Walnut caterpillar has been unusually abundant in pecan orchards at Albany during August and September and has caused considerable damage. In some instances the foliage has been stripped from pecan trees, but more generally individual large branches have been stripped.

Mississippi. L. J. Goodgame (September 24): A few young pecan trees in Pontotoc County were being defoliated on September 19.

PECAN LEAF CASEBEARER (Acrobasis juglandis LoB.)

Georgia. G. F. Moynette (September 15): The summer cases of pecan leaf casebearer were not as abundant at Albany as for the same period last season, which would apparently indicate that in this vicinity this insect will not cause a great deal of damage next spring.

PECAN NUT CASEBEARER (Acrobasis caryae Grote)

Georgia. G. F. Moynette (September 15): The third-generation larvae are now feeding on the shucks of pecans at Albany, and are more readily found than they were last season. This indicates that more immature larvae will go into hibernation and cause a greater infestation next spring.

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Georgia. G. F. Moynette (September 15): This insect has been quite numerous in pecan orchards during September in the vicinity of Albany, and is causing considerable damage. The shells on most varieties of pecan nuts have now hardened and the larvae instead of boring directly into the nuts are working only in the shucks.

TWIG GIRDLER (Oncideres cingulatus Say)

Georgia. S. O. Hill (September 15): This insect has been reported from Dawson as causing considerable damage in pecan orchards.

Mississippi. C. Lyle (September 24): The pecan twig girdler is moderately abundant in the vicinity of Jackson.

BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Connecticut. E. P. Felt (September 23): The characteristic discoloration of hickory leaves, the work of the small black aphid, is very prevalent on hickories in the Stamford area.

Georgia. G. F. Moynette (September): The black pecan aphid has been a troublesome pest during August and the early part of September in pecan orchards at Albany, especially those where bordeaux mixture has been used

for disease control. However, it is now on the decline.

Mississippi. C. Lyle (September 24): The black pecan aphid was causing medium damage on pecan at Durant, according to Inspector D. W. Grimes, and was also abundant at Meridian.

A PHYLLOXERA (Phylloxera caryaeseptem Shin.)

North Carolina. C. H. Brannon (September 12): Heavily infested pecan leaves sent in from Edgecombe County. (Det. by L. H. Weld)

CITRUS

CITRUS WHITEFLIES (Dialeurodes spp.)

Florida. J. R. Watson (September 24): The infestation of whiteflies in most of the citrus is the heaviest in many years. Many groves are pretty thoroughly blackened. The cloudy-winged whitefly (D. citrifolii Merg.) is chiefly responsible for this increase in numbers. In many sections of the Citrus Belt it has now become the dominant species where D. citri Ashm. was formerly the chief form.

Mississippi. C. Lyle and assistants (September 24): Heavy infestations of whiteflies have been observed along the coast on satsuma oranges and shrubbery. Many broad-leaved evergreens at Poplarville have been defoliated.

CITRUS RUST MITE (Phyllocoptes oleivorus Ashm.)

Florida. J. R. Watson (September 24): Rust mites have been more troublesome than usual at this time of year, because we have had less than normal rain.

FIG

A NITIDULID (Carpophilus marginatus Er.)  
HACKBERRY BUTTERFLY (Chlorippe celtis Bdv. & Lec.)

Alabama. J. M. Robinson (September 25): These two insects in association were reported on September 18 as having seriously damaged late figs in Birmingham.



TRUCK - CROP INSECTS

BLISTER BEETLES (Epicauta spp.)

Massachusetts. E. P. Felt (September 23): Margined blister beetles (E. marginata F.) were reported in abundance from Sharon.

Ohio. E. W. Mendenhall (September 1): Blister beetles (E. pennsylvanica Deg.), are quite abundant on aster and gladiolus plants in central Ohio.

Tennessee. G. M. Bentley (August 26): Blister beetle, E. cinerea Forst., is damaging sweetpotato vines at Selmer in McNairy County.

Mississippi. C. Lyle (September 24): E. lemniscata F. was attacking vegetable crops in Grenada, Yalobusha, and Marshall Counties, according to Inspector N. L. Douglass. Specimens of E. marginata were received from Wesson on September 15.

STRIPED CUCUMBER BEETLE (Diabrotica vittata F.)

Minnesota. A. G. Ruggles and assistants (September): The striped cucumber beetle has been very abundant in Lac qui Parle, Renville, and Pipestone Counties. It was very abundant in Winona County also, and seemed to continue its damage long into the summer. Many of the squash blossoms never developed squash because the beetles were so numerous.

SPOTTED CUCUMBER BEETLE (Diabrotica duodecimpunctata F.)

Missouri. L. Haseman (September 25): From September 1 to about the 20th late squashes and cucumbers were more heavily infested with both spotted (D. duodecimpunctata) and striped cucumber beetles (D. vittata) than for many years past at this season. They seriously interfered with the setting of the fruits and have actually shredded a great deal of the new foliage.

Florida. F. S. Chamberlin (August): D. duodecimpunctata is causing slight injury to string beans in Gadsden County.

Illinois. W. P. Flint (September 24): Adults of the southern corn rootworm have been very abundant during the last month.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Florida. J. R. Watson (September 24): N. viridula is scarcer than it has been in many years.

F. S. Chamberlin (August): The southern green plant bug is very abundant on field peas and other host plants in Gadsden County.

CORN EAR WORM (Heliothis obsoleta F.)

North Carolina. W. A. Thomas (August 31): The corn ear worm is particularly

destructive to lima beans at Chadbourn. The damage is caused by the larvae boring into the nearly mature pods and destroying the seed.

Mississippi. C. Lyle (September 24): Serious injury to fall tomatoes was reported at Poplarville by J. E. Lee and at Jackson by Jack Milton.

Washington. R. S. Lehman (September 28): The corn ear worm, which did extensive damage to sweet corn at Walla Walla earlier in the season, has been very destructive to tomatoes. Fields of tomatoes nearest to sweet corn have shown greater damage than others. One field was noted that had no marketable tomatoes.

California. A. E. Michelbacher (September 24): An examination of the tomato fields in Sacramento and Yolo Counties on August 30 and 31 showed only a little fruit infested. With a single exception, the infestation was less than 4 percent. In one field at Sacramento 6 percent of the ripe fruit was infested, while about 20 percent of the small green fruit contained worms. In the tomato-growing district about Brentwood the infestation on tomatoes has remained light. There is some indication that the infestation is going to build up. In several fields examined from 4 to 6 percent of the small green fruit was infested. The only area where the corn ear worm has been very destructive is in the San Francisco Bay district. Some fields have had as much as 20 percent of the fruit damaged, but the general average is much below this, usually being less than 10 percent.

#### POTATO AND TOMATO

##### COLORADO POTATO BEETLE (*Leptinotarsa decemlineata* Say)

Alabama. J. M. Robinson (September 25): The Colorado potato beetle is moderately abundant in central Alabama.

Mississippi. J. Milton (September 24): The Colorado potato beetle is present in nearly all fields of fall potatoes around Jackson.

Minnesota. A. G. Ruggles and assistants (September): The Colorado potato beetle is very abundant in Itasca, Crow Wing, and Freeborn Counties.

Utah. G. F. Knowlton (September 26): The Colorado potato beetle has not extended its range in southern Weber and in northern Utah Counties this season.

##### POTATO TUBER WORM (*Gnaptorhynchus operculella* Zell.)

California. A. E. Michelbacher (September 24): In the San Francisco Bay district there is a light infestation of larvae on tomatoes.

Mexico. T. R. Stephens (September 8): Thirteen larvae collected from potatoes in the Market House at Matamoros were determined by C. Heinrich as G. operculella.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. J. C. Elmore (August 24): The tomato pinworm was quite numerous on young tomato plants in a greenhouse in Modesto. Young plants were seriously damaged by leaf folding and stem boring. The insects were first noticed in December 1935 on tomatoes in the same house. Plants from this house which were set in a field early in the spring are now heavily infested. Seven percent of the ripe fruit was infested. (September 18): The tomato pinworm has built up to injurious numbers in the Stanton district of Orange County and the Artesia district of Los Angeles County. Infestations range from 25 to 60 percent of the ripe fruit.

TOMATO WORMS (Protoparce spp.)

Ohio. E. W. Mendenhall (September 15): The tomato worm (P. quinquemaculata Haw.) is quite numerous in tomato fields in central Ohio.

California. J. C. Elmore (August 26): P. quinquemaculata and P. sexta Johan. were quite numerous in tomato fields in Stanislaus County. In many fields every plant was damaged and many of them were from one-half to three-fourths defoliated.

POTATO LEAFHOPPERS (Empoasca spp.)

Minnesota. A. G. Ruagles and assistants (September 17): The potato leafhopper (E. fabae Harr.) is very abundant in Winona, Crow Wing, Lake, and Chippewa Counties.

Utah. G. F. Knowlton (September 28): The leafhopper, E. filamenta DeLong, has caused from moderate to severe injury to potatoes in parts of the State.

TOMATO STILTBUG (Jalysus spinosus Say)

North Carolina. W. A. Thomas and F. A. Wright (August 18): Most of the fruit buds formed on tomatoes during this period of the year at Chadbourn dropped off, even before the blossoms opened. It was found that large numbers of this insect were present in the tomato fields and, unless disturbed, were nearly always resting on the bloom or fruit bud.

BEANS

MEXICAN BEAN BEETLE (Epilachna varivestis Muls.)

Virginia. H. G. Walker (September 25): At Norfolk the Mexican bean beetle has not been as abundant this year as last.

Georgia. T. L. Bissell (June 1): The bean beetle is plentiful and injurious at Richland, in Stewart County, and at Blairsville, in Union County. It has done little damage in the Experiment district. A grower at Richland reports damage last fall.



G. H. Alden (September 24): Mexican bean beetle very bad on late snap beans in Habersham and Rabun Counties.

Alabama. J. M. Robinson (September 25): The Mexican bean beetle increased in numbers during the latter part of August and in September in central and northern Alabama, necessitating control measures.

Mississippi. C. Lyle (September 24): Severe injury was reported from Laurel on September 11. L. J. Goodgame reported on September 15 that the bean beetle was damaging both late and early beans in Monroe and Union Counties.

Utah. G. F. Knowlton (August 19): Mexican bean beetles have seriously damaged beans at Moab.

LIMA BEAN VINE BORER (Monoptilota pergratialis Hulst)

Maryland. E. N. Cory (September 4): The lima bean stalk borer has been reported from Hurlock.

North Carolina. W. A. Thomas (September 1): Lima bean vine borer unusually abundant in the Chadbourn area this season. Many of the vines have from 1 to 10 galls caused by the larvae. In a few instances they have caused the death of the vines.

SEED CORN MAGGOT (Hylemyia cilicrura Rond.)

New Jersey. T. L. Guyton (September 28): Maggots were numerous on string beans at Bound Brook on August 28. Adults were noted on September 3.

BEAN THRIPS (Heliothrips fasciata Perg.)

California. H. J. Ryan (September 28): Beans in the San Fernando Valley are heavily infested by the bean thrips. As the beans are being harvested, it would not be profitable to treat them.

CABBAGE

IMPORTED CABBAGE WORM (Ascia rapae L.)

Connecticut. N. Turner (September 21): The cabbage worm has been very scarce in southern Connecticut all season.

Virginia. E. G. Walker (September 25): Imported cabbage worms are very scarce in the Norfolk area.

Ohio. N. F. Howard (September 18): Cabbage worms are reported to be numerous and injurious to cabbage at South Point.

B. J. Landis (September 4): The imported cabbage worm was numerous at Athens on September 4 on broccoli and cauliflower.

Minnesota. A. G. Ruggles and assistants (September): The imported cabbage worm is very abundant in Freeborn, Winona, Crow Wing, and Benton Counties.

SOUTHERN CABBAGE WORM (Ascia protodice Bdv. & Lec.)

Georgia. T. L. Bissell (September 9): Butterflies were found ovipositing on collard plants just out of the ground at Experiment.

Ohio. B. J. Landis (September 15): Larvae of the southern cabbage butterfly were more numerous than usual at Columbus. On September 15, 80 worms were collected from 100 feet of row of Chinese cabbage. A few larvae were found on rape and turnips.

CABBAGE LOOPER (Autographa brassicae Riley)

Connecticut. N. Turner (September 21): Cabbage looper slightly less abundant than usual this year in southern Connecticut.

Virginia. H. G. Walker (September 25): The cabbage looper was becoming rather abundant in many cabbage and collard fields in the Norfolk area; however, since the hurricane and the 4-inch rain accompanying it on September 18, many of the loopers died from a bacterial disease.

Ohio. B. J. Landis (September): Cabbage loopers were abundant on turnips on September 16 at Columbus and on Chinese cabbage at Athens on September 4. At the latter place they were damaging the outer leaves.

Kentucky. W. A. Price (September 25): Cabbage loopers common on cabbage and turnips in the Bluegrass area.

Mississippi. C. Lyle and assistants (September 24): A. brassicae was collected on soybeans at Burnell on September 16 and on turnips and mustard in Grenada and Yalobusha Counties. Serious damage to turnips was observed in Union County.

DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Virginia. H. G. Walker (September 25): Larvae are becoming moderately abundant in cabbage and collard fields around Norfolk.

Ohio. T. H. Parks (September 26): Injury from the larvae is now heavy in some northern counties.

HAWAIIAN BEET WEBWORM (Hymenia fascialis Cram.)

Virginia. H. G. Walker (September 25): The Hawaiian beet webworm was very abundant at Norfolk and did considerable damage to young kale during the latter part of August and the early part of September.

HARLEQUIN BUG (Murgantia histrionica Hahn)

Virginia. H. G. Walker (September 25): The harlequin bug has been very scarce this year at Norfolk.

Mississippi. C. Lyle (September 24): Plant Board inspectors reported harlequin bugs rather general throughout the State.

CABBAGE MAGGOT (Hylemyia brassicae Bouche)

Tennessee. G. M. Bentley (September 17): Cabbage maggot has been reported as working on turnips at Erwin in Unicoi County.

California. J. C. Elmore (August 29): The cabbage maggot, which is attacking cauliflower near Temple City, Los Angeles County, has damaged from 2 to 20 percent of the plants. Of 700 plants counted in a field 52, or 7.4 percent, were infested.

FALSE CHINCH BUG (Nysius ericae Schill.)

North Carolina. W. A. Thomas (August 29): The false chinch bug was observed to be very abundant on cruciferous crops on the experimental plots at Chadbourn; however, the injury was almost negligible.

STRIPED FLEA BEETLE (Phyllotreta vittata F.)

North Carolina. W. A. Thomas (August 15): The striped flea beetle has been very injurious to broccoli and other cruciferous crops in the Chadbourn area during the past few weeks. Most of the foliage has been riddled with small holes and the plant growth considerably checked.

MELONS

MELON APHID (Aphis gossypii Glov.)

Missouri. L. Haseman (September 25): At Columbia late melon and cucumber vines are being killed by the melon aphid.

MELON WORMS (Diaphania spp.)

North Carolina. W. A. Thomas (September 1): D. hyalinata L. and D. nitidalis Stoll are extremely abundant on late squash and pumpkins in the Chadbourn area. Young fruit is being destroyed as fast as it forms and the tips of the vines are being killed.

SQUASH

SQUASH BUG (Anasa tristis Deg.)

Missouri. L. Haseman (September 25): The usual heavy fall infestation of this common pest of cucurbits has occurred throughout much of the State.



Tennessee. G. M. Bentley (August 4): Squash bugs found on pumpkin and squash vines at Greenfield, Weakley County. Vines destroyed 100 percent. Reported by E. P. Deuberry.

#### SQUASH BEETLE (Epilachna borealis F.)

North Carolina. W. A. Thomas (September 2): Larvae are defoliating late squash and pumpkins in the Chadbourn district. Apparently the insect is much more abundant this season than it was last.

#### TURNIP

##### TURNIP APHID (Rhopalosiphum pseudobrassicae Davis)

Mississippi. L. J. Goodgame (September 24): Plant lice, R. pseudobrassicae, were destroying turnips in Union County on September 21.

##### CABBAGE WEBWORM (Hellula undalis F.)

Georgia. T. L. Bissell (September 9): Small turnip plants at Experiment are being webbed by Hellula caterpillars, which are not more than one-third grown.

#### EGGPLANT

##### EGGPLANT LACEBUG (Gargaphia solanii Heid.)

Mississippi. C. Lyle (September 24): The eggplant lacebug was causing serious damage to eggplants at State College on September 20. An infestation at Durant was reported by Inspector D. W. Grimes.

#### ONIONS

##### ONION THRIPS (Thrips tabaci Lind.)

Virginia. H. G. Walker (September 25): Onion thrips were moderately abundant on young kale, collards, and cabbage from the last of August to the middle of September in the Norfolk district.

California. A. F. Howland (August 28): Over 30 acres of onions in the Lompoc Valley were badly infested. The bulbs were greatly reduced in size. Only about 1 bulb in 12 will reach first-grade size. Few tops in the field showed any green foliage.

#### STRAWBERRY

##### LESSER CORNSTALK BORER (Elasmopalpus lignosellus Zell.)

North Carolina. W. A. Thomas (September 8): On examining the experimental plots of strawberries at the Willard test farm it was observed that the lesser cornstalk borer was causing unusual damage to the crowns of older plants and the young runner plants. In many instances the entire crown

had been killed and supplementary buds were developing around the base of the plants. Many of the runner plants were killed outright before having an opportunity to take root. This crop followed a crop of soybeans of last season.

#### PEPPER

##### LEAF-FOOTED BUG (Leptoglossus phyllopus L.)

Georgia. T. L. Bissell (September 10): Nymphs are found clustered on pin-into pepper fruit at Vaughn.

#### SWEETPOTATO

##### SWEETPOTATO WEEVIL (Cylas formicarius F.)

Mississippi. G. L. Bond (September 24): At Moss Point a much lighter infestation of the sweetpotato weevil this season, due largely to the extremely cold weather killing all potatoes and vines in the fields last winter and preventing volunteers.

Oklahoma. F. A. Fenton (September 9): Specimens collected at Fairview, Major County, were identified by L. L. Buchanan.

#### SUGAR BEETS

##### BET LEAFHOPPER (Eutettix tenellus Bak.)

Colorado. C. A. Hills (September 22): The sugar beet crop in the beet-growing sections of the western slope of Colorado is considerably above average this year. Large, vigorous beets are found generally in the Grand Valley, Delta-Montrose, and Rifle districts. This favorable condition of sugar beets is partly due to the low populations of beet leafhopper, which dispersed into these districts in April and May.

Utah. G. F. Knowlton (September 26): Moderate damage to beets has occurred in places near the local breeding areas.

##### YELLOW WOOLLY BEAR (Diacrisia virginica F.)

Colorado. S. C. McCampbell (September 21): The yellow bear caterpillar has been unusually abundant in both northern and eastern Colorado, especially in the Rocky Ford district where it caused considerable injury to sugar beets.

#### TOBACCO

##### TOBACCO WORMS (Protoparce spp.)

Maryland. E. N. Cory (September 25): Hornworms are doing considerable damage to tobacco and tomatoes generally.

Florida. F. S. Chamberlin (August): Hornworms, P. sexta Johan., are found in Gadsden County in occasional fields of sun-grown tobacco in which the stalks are still standing.

Tennessee. G. M. Bentley (September 3): The tobacco worms, P. sexta and P. quinquemaculata Haw., have done considerable damage in Henry and Weakley Counties.

#### MUSHROOMS

##### MITES (Tarsonemus spp.)

Maryland. F. F. Smith (September 30): In the spring of 1936 T. floricolus C. & F. was found in spawn from the mushroom beds at Beltsville. The mites occurred rarely, and did no apparent damage. Three generations were reared in the laboratory. (Det. by H. E. Ewing)

Pennsylvania. A. C. Davis (September 29): A mite, Tarsonemus sp., is doing a great deal of damage in a commercial mushroom house near Toughkenamon, Chester County. The mites are so numerous that they look like brown powder on the caps of the mushrooms. They chew the feeder roots, causing the mushrooms to die, and also eat holes in the caps. A house near Oxford, Chester County, has been reported to be similarly infested.

#### C O T T O N I N S E C T S

##### BOLL WEEVIL (Anthonomus grandis Boh.)

North Carolina. C. H. Brannon (September 25): Many sections of the State show heavy weevil infestation; other sections are lightly infested.

South Carolina. F. F. Bondy (September 5): The late cotton at Florence that has not been poisoned is now overrun with weevils. The poisoned cotton is still in full bloom. (September 26): Cotton is taking a second growth and weevils are increasing, but the number in the fields is still below normal.

Georgia. T. L. Bissell (September 9): The boll weevil is numerous on cotton at Experiment..

P. M. Gilmer (September 5): At Tifton the infestation has continued to increase slowly in Upland cotton. In Sea Island cotton practically 100 percent of the squares are now attacked in the unpoisoned fields. Where squaring is still in progress a majority of the squares are now attacked and injury in unpoisoned fields is becoming rather serious. It is doubtful whether many of the unopened bolls will mature. (September 26): Breeding has apparently almost ceased. Fall movement seems to be well under way.

Tennessee. G. M. Bentley (September 3): J. C. Moser reports that he has not heard of or seen any boll weevil in Tennessee this year.



Alabama. J. M. Robinson (September 25): The boll weevil infestation at Auburn did not become sufficiently high to require dusting the cotton. In southern Alabama, particularly in the southwestern part, some dusting was necessary.

Mississippi. C. Lyle (September 24): The boll weevil infestation in the State is very light. In some sections in the central part of the State the weevils were numerous enough to puncture practically all of the late squares, but this condition was not general and practically no damage has been done.

E. W. Dunnam (September 5): In Washington County a few weevils can be found in green spots where there is some fruit available, but the population is almost negligible away from the wooded areas. Migration has been very light.

Louisiana. R. C. Gaines (September 26): During the past 4 weeks there has been a scarcity of squares and bolls at Tallulah for the late breeding of the boll weevil, owing to the stripping caused by the leaf worm (*Alabama argillacea* Hbn.); however, some cotton that was stripped some time ago is now taking on second growth, which may afford a considerable number of squares for late breeding.

Oklahoma. C. F. Stiles (September 25): Boll weevils have done less damage to cotton this year than at any time since they became generally established in Oklahoma. One has to search carefully in the fields in the east side of the State, where they are usually quite numerous, to find adult weevils.

Texas. R. W. Moreland (September 12): The weevil infestation record in late cotton for the second brood at College Station is as follows: 3,600 squares examined in three experiments; the check plots ranged from 13.3 to 18.3 percent, with an average of 16.7 percent; the treated plots ranged from 0.3 to 13.3 percent, with an average of 4.2 percent; the treated plot, with 13.3 percent infestation, had received only two applications of poison.

K. P. Ewing (September 5): At Port Lavaca weevils continue to damage many fields. (September 12): There was a wide-spread migration of boll weevils during this week. Observation of cotton fields in Calhoun and Jackson Counties indicates that practically 100 percent of all squares and bolls are being damaged, and even large bolls are being punctured. The small late crop that was anticipated a few weeks ago is being reduced.

Mexico. C. S. Rude (September 5): At Tlahualilo the boll weevil infestation in new squares is very heavy and the top crop is being damaged considerably. (September 22): The crop from the Don Martin project is ginning out about 50 percent as much as it has for the past 2 years, notwithstanding the increased acreage this year. The reduction is accounted for by failure to control the boll weevil.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Connecticut. M. P. Zappe (September 23): Flight of moths all over lights and on buildings in the city of Torrington. Some had found their way into stores.

North Carolina. C. H. Brannon (September 15): Heavy infestations in Nash, Iredell, and Mecklenburg Counties reported. The list is growing every day. Most of it is on very late cotton, making the infestation very serious. (September 18): Leaf worms are now reported from almost all cotton sections of the State. We have a great deal of late cotton, which will no doubt be seriously damaged. (September 25): Late cotton in all parts of the State is being attacked.

South Carolina. F. F. Bondy (September 5): At Florence cotton leaf worms are increasing and are beginning to defoliate fields of young cotton. (September 19): Increasing very slowly. Parasites apparently have them in check and no fields have been defoliated.

Georgia. T. L. Bissell (August 31): Caterpillars abundant on cotton at Experiment Station. It was reported to me today that worms were seen feeding at Cedartown on August 14. (September 9): The cotton leaf worm is doing considerable damage because, on account of drought in the early summer, cotton is late.

T. O'Neill (September 24): A flight of moths began about September 16 and they are still present, causing much nuisance in tall buildings which are lighted at night. A 50-percent loss in efficiency is reported of workers at machines or instruments that require close and constant attention. One report of damage to ripe figs.

P. M. Gilmer (August 29): At Tifton cotton leaf worms are beginning to appear in considerable numbers, especially in Sea Island cotton. There has been no stripping. (September 26): Leaf worm is present in nearly all fields but not in exceptional numbers. There is considerable ragging in many fields and occasionally some stripping.

O. I. Snapp (August 28): The cotton leaf worm is very abundant in cotton fields at Montezuma, Marshallville, and Fort Valley. This insect damaged late cotton that was blooming the latter part of August.

G. F. Moznette (September 15): This insect has been unusually abundant in cotton fields in south Georgia and has caused a great deal of damage, especially in fields where the cotton was considerably set back by the drought earlier in the season, and where a large percentage of the bolls have not yet matured.

W. F. Turner (September 25): In the area below Macon the cotton was late this year. Growers had excellent prospects 3 weeks ago. They report many fields in which a considerable proportion of the bolls were only half-grown have been stripped, and they look for a material reduction in crop.



Alabama. J. M. Robinson (September 25): The cotton leaf worm appeared generally over the State throughout the latter half of August and September. The cotton was sufficiently advanced in southern and central Alabama that very little damage was done to it. In northern Alabama, however, where the cotton was late, considerable damage was done and a lot of dusting was necessary to hold this pest in check.

Mississippi. C. Lyle (September 24): The cotton leaf worm is generally distributed over Mississippi, but the amount of damage has been very light on account of the early maturity of the cotton.

E. W. Dunnam (September 5): The cotton leaf worm is increasing in many fields in Washington County but, as the crop is mature, the farmers are not poisoning. (September 19): About 50 percent of the cotton has been stripped and more stripping is being done. The moths are just beginning to emerge from the last generation.

Louisiana. R. C. Gaines (September 5): At Tallulah considerable stripping has occurred during the past week but planters have discontinued poisoning. (September 26): Leaf worms continue to strip cotton.

Missouri. W. F. Turner (September 25): Stripping cotton in Scott, Stoddard, and Pemiscot Counties. In many fields the plants have been entirely stripped, with much of the crop in half-grown bolls.

Arkansas. W. F. Turner (September 25): Stripping cotton in Mississippi and Crittenden Counties, Arkansas.

Oklahoma. C. F. Stiles (September 25): Cotton leaf worm present throughout practically the entire State in very limited numbers.

Texas. R. W. Moreland (September 5-19): Where no poison has been used the leaf worms are stripping the cotton plants at College Station.

K. P. Ewing (September 12): There was an increase in infestation this week which resulted in many farms in Calhoun County being poisoned again.

A. J. Chapman (September 5): At Presidio and over the Rio Grande Valley leaf worms are now generally distributed. Owing to recent rains, it was necessary for the farmers to apply poisons again. (September 19): Although light spotted infestations occur throughout the valley, the farmers have discontinued poisoning.:

Arizona. T. P. Cassidy (September 5): Cotton leaf worms continue to rag cotton on the experimental farm at Tucson, approximately one-fourth of the foliage on the plants having been eaten. A general infestation is present in all of the commercial cotton area in the vicinity of Tucson. All stages of worms are present in the fields. Only about 20 acres have been completely stripped. (September 10): Approximately 10 acres of cotton at Buckeye were found to be lightly infested. While several reports have been received, this is the first authentic record in the Salt



River Valley this year. Commercial damage is not anticipated.

Mexico. C. S. Rude (September 1): The cotton leaf worm appeared in large numbers in many places in the Laguna during the week. (September 8): Cotton is being defoliated. (September 15): The infestation is widespread over the entire Laguna district and reports of it have been received from Las Delicias, Chihuahua.

BOLLWORM (Heliothis obsoleta F.)

South Carolina. F. F. Bondy (September 26): At Florence the bollworm is doing considerable damage in fields of late cotton.

Georgia. P. M. Gilmer (September 19): At Tifton little injury has been noted practically no bollworms present.

Mississippi. C. Lyle (September 24): Severe damage was reported from Sandy Hook on August 28 and from Monticello on September 1.

Louisiana. R. C. Gaines (September 5): At Tallulah some bollworms can be found in practically all fields, poisoned and unpoisoned.

Texas. K. P. Ewing (September 12): At Port Lavaca, the bollworm can still be found doing considerable damage in some fields, although most of the worms have matured.

R. W. Moreland (August 29): At Bryan, in examining 1,480 cotton terminals, 183 eggs were found, or an average of 13 eggs per 100 terminals.

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. F. S. Puckett (August 17): Gin-trash inspections have gone forward very rapidly in the lower Rio Grande Valley of Texas. The first pink bollworm specimen was found at Brownsville on August 11, and by the end of the week 3 additional ones had been found. At San Benito the first specimen was found on August 12, and by the end of the week a total of 15 had been collected. At Rio Grande City one specimen was found on August 15. This makes a total of 20 specimens found in the valley during the week.

A. J. Chapman (September 5): On most of the farms in the vicinity of Presidio an irrigation is being applied immediately after the first picking. This practice will, of course, tend to keep the cotton fruiting and to build up a heavy pink bollworm infestation. Boll infestation records were made in 15 fields. The average infestation in these fields was 64.60 percent, ranging from 11 to 100 percent. Infestation in 9 of the 15 fields last year was 77.33 percent, as compared to 78.56 percent this year. (September 12): Boll infestation counts were made in 12 fields, which averaged 59.4 percent ranging from 10 to 100 percent. The average infestation in the same fields last year was 36.6 percent and ranged from 7 to 94 percent. (September 19): The infestation counts made

in 20 fields ranged from 54 to 100 percent, or an average of 90.95 percent. The number of bolls per plant ranged from 1.5 to 14.4, or an average of 6.1. The infestation in 12 of these fields last year was 81.92 percent, as compared to 94.75 percent this year, with the average for the number of bolls per plant 6.1, as compared to 5.6. (September 26): Boll infestation counts were made in 10 fields during the week, the average being 90.60 percent, with an average of 5.2 bolls per plant. Last year the average infestation in these fields was 52.40 percent, with an average of 7.4 bolls per plant.

Mexico. F. S. Puckett (August 17): On the Mexican side of the river, Mr. West has continued to find large numbers of specimens at Matamoros. By the end of the week a total of about 294 had been collected. At Reynosa, about 60 miles up the river from Matamoros, 8 specimens have been collected. Gin-trash inspection is also being done in Mexico at Sabinas Hidalgo, and the Don Martin project, where results have been negative to date.

C. S. Rude (September 1): The pink bollworm infestation continues to increase and is general over the whole Laguna district. (September 8): The infestation is approximately 100 percent, with from 18 to 20 worms per boll in many places. The late crop will be seriously damaged.

#### COTTON LEAF PERFORATOR (Bucculatrix thurberiella Busck)

Arizona. C. D. Lebert (September 15): The cotton leaf perforator has been observed in several fields of long-staple cotton, and severe foliage injury was noted. Dusting was recommended, as this cotton has about 5 weeks yet to "make."

#### F O R E S T   A N D   S H A D E - T R E E   I N S E C T S

##### FALL WEBWORM (Hyphantria cunea Drury)

New England and New York. J. V. Schaffner, Jr. (September 21): The fall webworm throughout New England and eastern New York is, in general, rather scarce. In a few localities in northeastern Connecticut, Rhode Island, and southeastern Massachusetts, the webs are common, with occasional isolated areas where they are rather abundant, particularly on wild cherry and old apple trees.

Massachusetts. A. I. Bourne (September 24): On the whole the fall webworm has been less abundant than usual, particularly in the eastern part of the State, where the heaviest infestations normally occur.

Connecticut. W. E. Britton (September 22): Nests are exceedingly scarce throughout the State, as compared with other seasons.

Georgia. G. F. Moznette (September 15): Fall webworm has not been so abundant on pecan at Albany as in former years.

Mississippi. C. Lyle (September 24): A complaint of the fall webworm on pecan

was received from Grenada on August 26. State Plant Board inspectors report that the infestation over the entire State is very light. No defoliation has occurred.

CHAIN-SPOTTED GEOMETER (Cingilia catenaria Drury)

Connecticut. J. C. Schroad (September 20): Countless numbers of moths on the west side of Derby, flying around lights.

TWO-LINED CHESTNUT BORER (Agilus bilineatus Web.)

New York. E. P. Felt (September 23): The work of the two-lined chestnut borer continues to be serious in various areas on the northern shore of Long Island, especially in the vicinity of St. James.

BEECH

BEECH SCALE (Cryptococcus fagi Baer.)

Maine and Massachusetts. J. V. Schaffner, Jr. (September 21): R. C. Brown reports a general increase in the infestations in Maine and eastern Massachusetts. In several localities the infestations are heavy.

BIRCH

BIRCH SKELETONIZER (Bucculatrix canadensisella Chamb.)

New York. R. E. Horsey (September 24): One large tree of canoe birch at Rochester has about every leaf more or less spotted with the work of the birch skeletonizer. Larvae and the "false or moulting cocoons" can be found on this date. Only a few were on red birches that were badly infested in 1922, when they were found on 12 different species of birch.

OYSTER-SHELL SCALE (Lepidosaphes ulmi L.)

Ohio. E. W. Mendenhall (September 5): Oyster-shell scales are very thick on the bark of birch trees in a nursery at New Moorfield.

ELM

ELM LEAF BEETLE (Galerucella xanthomelaena Schr.)

Connecticut. W. E. Britton (September 22): Little damage has occurred in Connecticut this season, but adults have been received from Bridgeport, Manchester, and Somers.

Ohio. T. H. Parks (September 23): Elm leaf beetles have crawled into houses in some sections of Columbus.

ELM BUD MIDGE (Phytophaga ulmi Beautm.)

New York. E. P. Felt (September 23): The elm bud midge was reported as a serious pest in elm seedlings at Yonkers.



ELM COCKSCOMB GALL (Colopha ulmicola Fitch)

Ohio. N. F. Howard (September 21): This woolly aphid is so abundant on stinkgrass (Eragrostis cilianensis) that the clumps are white and very noticeable.

EUROPEAN ELM SCALE (Gossyparia spuria Mod.)

Ohio. E. W. Mendenhall (September 5): The European elm scale is found in elm tree stock in the nurseries.

OAK

TWIG PRUNER (Hypermallus villosus F.)

Massachusetts. A. I. Bourne (September 24): The oak twig pruner has been unusually abundant during the past summer over practically the entire State. Nearly all the oaks along the roadsides and in the woodlands show more or less infestation, and many of them are beginning to show serious effects from the infestations of the last two or three seasons.

CARPENTER WORM (Prionoxystus robiniae Peck)

Connecticut. E. P. Felt (September 23): Carpenter worms were found in numbers in a white oak at Old Lyme.

CYNIPID GALLS (Cynipidae)

Nebraska. M. H. Swenk (September 23): Specimens of oak leaves heavily infested with the galls of Amphibolips racemaria Ashm. and Biorhiza forticornis Walsh were sent in from Knox County on September 10.

OAK PILL GALL (Cincticornia pilulae Walsh)

Pennsylvania. E. P. Felt (September 23): The oak pill gall is somewhat common in the Philadelphia district, probably more important because of its disfiguring the foliage than on account of actual injury.

PINE

PINE NEEDLE SCALE (Chionaspis pinifoliae Fitch)

Connecticut. M. P. Zappe (September): This insect appears to be more abundant on pines, principally sugar, in nurseries over the entire State than usual.

New York. R. E. Horsey (September 20): A large amount of newly set pine needle scale was found on Austrian pine at Rochester on September 20.

Utah. G. F. Knowlton (September 27): The pine needle scale has caused considerable injury to ornamental, and in some places to forest pines and spruces, during the summer.

A PYRALID (Tetralopha robustella Zell.)

Connecticut. W. E. Britton (September 22): This moth lays eggs on various species of pine. The larvae form balls of frass, in which they live and feed upon the leaves. Recently reported from Branford, Clinton, and Deep River.

Maryland. E. N. Cory (September 24): T. robustella was reported as attacking loblolly pine at Glymont.

A WEEVIL (Hylobius radicis Buchanan)

Connecticut. G. H. Plumb (September 22): On May 5 a larva of H. radicis was taken from the same tree base out of which Pissodes approximatus Hopk. later emerged. The larvae were about 15 mm in length, and several trees were completely girdled, some already dead and others dying. Two larvae received from Sea Cliff, Long Island, on August 28 from Scotch pine, and identified by Adam Boving as H. radicis proved identical with the specimens taken at Old Lyme. These larvae were burrowing in the base of the trunk, between the ground level and the roots.

PLANETREE

SYCAMORE LACEBUGS(Corythucha sp.)

Alabama. J. M. Robinson (September 25): The lacebug was reported as defoliating sycamores at Jasper on August 20.

California. C. S. Morley (September 1): Native sycamore trees in Kern County were severely injured by attacks of the lacewing tingid. This insect has been observed feeding upon the plane sycamore trees for the first time this season.

POPLAR

A CERAMBYCID (Oberea schaumii Loc.)

Nebraska. M. H. Swenk (September 23): From Grant County on September 7 there came specimens of cottonwood twigs showing infestation.

SPRUCE

EASTERN SPRUCE BEETLE (Dendroctonus piceaperda Hopk.)

Vermont. J. V. Schaffner, Jr. (August 31): A serious outbreak of the eastern spruce barkbeetle occurs in the Green Mountain National Forest in an area between the Middlebury and Brandon Gaps. Over 90 percent of the merchantable spruce on an area of about 500 acres is now dead and the infestation is spreading to the adjoining Battell Memorial Park.

EUROPEAN SPRUCE SAWFLY (Diprion polytornum Htg.)

New England and New York. H. J. MacAloney (September 24): No noticeable

increase in the infestation in northern New England and northern New York; however, the State Forest Service of Maine reports some medium infestations in the northwestern part of that State. Although generations in southern Connecticut overlap considerably, data collected indicate at least three generations there.

#### WILLOW

##### A WEEVIL (Orchestes rufipes Lec.)

Massachusetts. E. P. Felt (September 23): The willow flea weevil was reported doing serious injury in Stockbridge.

Pennsylvania. E. P. Felt (September 23): The willow flea weevil was reported in moderate numbers in the Philadelphia area.

##### CURRENT STEM GIRDLER (Janus integer Nort.)

New York. R. E. Hersey (September): Several larvae of the willow shoot sawfly were found in strong shoots of the bluestem willow (Salix irrorata) and the golden willow (Salix vitellina) on September 11. Especially noticeable in sprout growth at the base of the golden willows. These are in an ornamental planting at Rochester.

#### INSECTS AFFECTING GREENHOUSE AND ORNAMENTAL PLANTS

##### A WASP (Scolia dubia Say)

North Carolina. C. H. Brannon (September 1): This species is more abundant than at any time during the past 10 years.

##### SOD WEBWORMS (Crambus spp.)

Missouri. L. Haseman (September 25): Throughout the State there is a deluge of several small species of crambid moths which are attracting considerable attention.

##### A LACEBUG (Corythucha cydoniae Fitch)

Georgia. J. A. Berley (September 15): Pyracanthas and other ornamentals are heavily infested and injured by this lacebug.

#### ALDER

##### A FLEA BEETLE (Altica ambiens alni Harr.)

New York. E. A. Back (September): A flea beetle was noted completely skeletonizing the alder bushes along the roadside at several points between Plattsburg and Lake Placid. The second week of August the alder swarms



appeared brown. Larvae were so mature that those placed in pill boxes matured as adults without further feeding. (Det. by H. S. Barber.)

AZALEA

AZALEA LACEBUG (Stephanitis pyrioides Scott)

Mississippi. C. Lyle (September 24): The azalea lacebug was found on azalea at Bucatunna on September 16 by Inspector M. L. Grimes. This is believed to be the first record of this insect in Mississippi. (This is the first report from Mississippi received by the Insect Pest Survey.)

BOXWOOD

A MITE (Neotetranychus buxi Garman)

Connecticut. W. E. Britton (September 22): This mite has now been recognized from two separate localities in Connecticut--Old Lyme and Saugatuck.

CEDAR

DEODAR WEEVIL (Pissodes nemorensis Germ.)

Alabama. J. M. Robinson (September 25): The deodar cedar weevil was reported as attacking deodars at Atmore on August 19.

CYPRESS

A TWIG BORER (Phloeosinus cristatus Lec.)

California. D. F. Barnes (September 16): Several instances of attack on ornamental cypress have been reported locally this fall around Fresno. In at least one instance it has been necessary to remove trees on account of the damage.

DAHLIA

SUNFLOWER WEEVIL (Rhodesbaenus tredecimpunctatus Ill.)

Virginia. H. G. Walker (September 25): Larvae were reported as seriously injuring dahlias during July and August in a flower garden in Norfolk.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

Virginia. H. G. Walker (September 26): The euonymus scale continues to be rather abundant and destructive to euonymus in Norfolk.

Mississippi. C. Lyle (September 24): Injury to euonymus was reported on August 28 from Aberdeen, and Inspector Jack Milton observed severe infestations in Canton during the month.

GLADIOLUS

GLADIOLUS THRIPS (Taeniothrips simplex Morison)

Ohio. E. W. Mendenhall (September 1): Gladiolus thrips are quite bad at some of the plantations in Clark County.

Utah. G. F. Knowlton (September 20): Thrips have caused serious injury to gladiolus in several gardens at Logan during the current season.

LILAC

LILAC BORER (Podosesia syringae Harr.)

New York. R. E. Horsey (September): Considerable injury to lilacs noted during the month at Rochester.

Ohio. E. W. Mendenhall (September 6): Lilac borers are very bad in lilac bushes on private property in Columbus and in central Ohio.

PALM

ROYAL PALM BUG (Xylastodoris luteolus Barber)

Florida. J. R. Watson (September 24): The palm weevil has been doing considerable damage in several sections of the lower part of the East Coast.

PHLOX

PHLOX BUG (Lopidea davisii Knight)

Maryland. G. S. Langford (September 18): The phlox bug has been reported on phlox generally.

I N S E C T S   A T T A C K I N G   M A N   A N D

D O M E S T I C   A N I M A L S

MAN

MOSQUITOES (Culicinae)

Maryland. E. N. Cory (September 18): Culex pipiens L. and Aedes sollicitans Walk. were reported as very annoying in a factory in the vicinity of Baltimore. A. sollicitans is very abundant in unditched marsh lands along the coast, particularly in Worcester County.

Missouri. L. Haseman (September 25): Since fall rains began there has been a rather severe outbreak of several species of mosquitoes throughout the State. Special complaints against them have occurred in the St. Louis district.

Tennessee. E. W. Howe (September): Culicid mosquitoes are very common at Clarksville; anophelines less common, but abundant.

BAT BEDBUG (Cimex pilosellus Herv.)

Delaware. P. L. Rice (September 29): An attic at Smyrna infested with bats was reported as being overrun with bat bugs. The bugs were said to be biting the people in the house and causing severe annoyance.

PUSS CATERPILLAR (Megalopyge opercularis S. & A.)

North Carolina. C. H. Brannon (September 9): A specimen of puss caterpillar was sent in from Pasquotank County with no information as to host plant.

SADDLEBACK CATERPILLAR (Sibine stimulea Clem.)

Maryland. E. N. Cory (September 7): The saddleback caterpillar is attacking rose at Annapolis.

Mississippi. C. Lyle (September 24): Saddleback caterpillars were received from Liberty on August 26, from McComb on September 12, and from Brookhaven on September 14. People sending them in had been stung.

DOG FLEA (Ctenocephalides canis Curt.)

Iowa. H. E. Jaques (September 23): Southeastern Iowa seems to have an epidemic of dog fleas in homes, where they are becoming unbearable.

AMERICAN DOG TICK (Dermacentor variabilis Say)

Maryland. F. C. Bishopp (September): No specimens of American dog tick have been collected or reported during September, yet four cases of Rocky Mountain spotted fever have been reported for the period from September 1 to 25, inclusive. They are as follows: Baltimore County, Owing Mills 1; Kent County, Chestertown, 1; Carroll County, Taneytown, 1; Anne Arundel County, Deale, 1.

BLACK WIDOW SPIDER (Latrodectus mactans F.)

Mississippi. C. Lyle (September 24): A complaint of the black widow spider was received from Eupora on September 4. This spider has attracted practically no attention this year, as compared to 1935.

Nebraska. M. H. Swenk (September 23): Reports of black widow spider were received from Custer County on August 28, from Cheyenne County on August 30, from Garden County on September 4, and from Brown County on September 18.

Utah. G. F. Knowlton (September 17): Black widow spiders have caused annoyance by invading homes at Salt Lake City and Brigham City recently.



CATTLE

SOREWORM (Cochliomyia americana C. & P.)

United States. W. E. Dove (September 26): At present the low incidence of screwworm cases in the Southeastern States permits curtailment of control work of the Bureau in some areas and more intensive work in southern Georgia and Florida. From June 5 to September 18 there were 16,187 reported cases of myiasis in Alabama, Florida, Georgia, Louisiana, Mississippi, and South Carolina, and of these 15,617 were reported from southern Georgia and Florida. During the 3-week period ending September 18, there were reported 3,175 cases from Florida; 125 from Georgia; 22 from Alabama; 49 from Louisiana; 2 from Mississippi; and 8 from South Carolina. All of these reports include infestations of blowfly maggots as well as screwworms. During this period collections of larvae were obtained from wounds where possible, but only ones collected in the stockyards at New Orleans, in southern Georgia, and in Florida were identified as C. americana. In the Southwestern States 93,952 cases of myiasis were reported from June 5 to September 18 as follows: Arizona, 601; California, 152; New Mexico, 15,137; Oklahoma, 666; and Texas (approximately 75 counties) 77,396. In these States control work is well received by stockmen and the application of recommendations is reducing cases by preventing infestations. From September 1 to 18 there were 16,445 cases as follows: New Mexico, 5,225; California, 88; Arizona, 317; Oklahoma, 266; and Texas, 10,549. Of these cases, 2,143 occurred in tick bites, 1,652 in navels of young, 3,193 in snags and scratches, and 2,640 in other causes which are not easily prevented. The incidence is unusually low in injuries resulting from surgical operations. In castrations there were 882, in dehorning 533, in marking 98, in branding 999, and in shear cuts 3,040.

HORSES

HORSE BOTFLY (Gastrophilus intestinalis Deg.)

Tennessee. G. M. Bentley (September 3): Horse botflies have been noticed in great numbers recently in western Tennessee by J. C. Moser.

HOUSEHOLD AND STORED-PRODUCTS

INSECTS

ANTS (Formicidae)

Massachusetts. A. I. Bourne (September 24): Throughout the season there have been many complaints of ants in lawns and as household pests.

Virginia. E. A. Back (September): The mound building ant (Formica exsectoides Forel.) is very abundant about the northern edges of the greens of a golf and country club at Cherrydale. Numerous mounds in the brush and vines just off the greens attracted much attention this month.

Florida. J. R. Watson (September 24): The so-called fire ants, Wasmannia auropunctata Roger, have been sent in from Arcadia. They are becoming very abundant and troublesome about Fort Lauderdale.

Tennessee. E. W. Howe (September): We have had numerous complaints of annoyance from ants at Clarksville.

Mississippi. C. Lyle and assistants (September 24): Many complaints of ants have been received from nearly all parts of the State during the past month. The Argentine ant (Iridomyrmex humilis Mayr) was causing much annoyance in places where no campaigns have been conducted. The ill-smelling ant (I. pruinosus Roger), the tiny black ant (Monomorium minimum Buckl.), Pharaoh's ant (M. pharaonis L.), the black carpenter ant (Camponotus herculeanus pennsylvanicus Deg.), and the fire ant, (Solenopsis xyloni McCook) were responsible for numerous complaints.

Nebraska. M. H. Swenk (September 23): On September 11 the large black carpenter ant (C. herculeanus pennsylvanicus) was reported to be infesting a large boxelder tree in Hitchcock County. Fornica fusca L. was reported to be infesting the fruits in a large patch of strawberries in Custer County on the 12th.

#### POWDER POST BEETLES (Lyctus spp.)

Massachusetts. A. I. Bourne (September 24): Our attention has been called to many instances of damage caused by powder post beetles. The large number of inquiries in regard to this pest have probably been due to the wide publicity given to termites. Many cases of supposed termite damage proved to be due either to carpenter ants or powder post beetles.

Connecticut. E. P. Felt (September 23): Powder post beetles came to notice at Stamford on account of extensive injury to an inner veneer, presumably of sapwood, in a dining-room table.

#### FURNITURE CARPET BEETLE (Anthrenus vorax Waterh.)

Maryland. E. A. Back (September): The furniture carpet beetle was received on September 15 from Baltimore, where it was reported to be seriously infesting a house. This is the first record in the Bureau of the presence of this pest in Maryland. It was also received during the past month from six localities in Washington, D. C.

#### VARIED CARPET BEETLE (Anthrenus verbasci L.)

General. E. A. Back (September): The varied carpet beetle was reported as a household pest during the past month by correspondents from Baltimore, Md.; Newport News, Va.; Seattle, Wash.; Portland, Oreg.; and San Diego, Calif.

#### CARPET BEETLE (Anthrenus scrophulariae L.)

Maine. E. A. Back (September): A pupa of the common carpet beetle, mailed at

Castine, was received as a newly emerged adult in Washington, D. C., on September 20.

A LARDER BEETLE (Dermestes cadaverinus F.)

Virginia. E. A. Back (September): Adults were received on July 31 from Portsmouth, where they were said to be abundant on a vacant lot.

SAW-TOOTHED GRAIN BEETLE (Oryzaephilus surinamensis L.)

Nebraska. M. H. Swenk (September 23): Specimens of the saw-toothed grain beetle were received on August 27 from Pierce County and on September 1 from Garden County. In the former report the pest was said to be infesting corn and rye, while the latter stated that large numbers of the insects were entering a building.

CORN SAP BEETLE (Carpophilus dimidiatus F.)

Mississippi. C. Lyle (September 24): An unusually severe outbreak of the corn sap beetle has occurred in the warehouse of a milling firm at Meridian during the past month. In the afternoons the air was literally filled with flying beetles.

DRIED FRUIT BEETLE (Carpophilus homipterus L.)

California. P. Simmons (August 21): This is our first record of the species in cactus pears. It was reported from Santa Barbara in the fallen, decaying cactus fruit.

A CERAMBYCID (Eburia quadricarinata Say)

Indiana. E. A. Back (September): A specimen of the four-lined ash borer was received on August 24 from a furniture dealer in St. Paul with the statement that it was captured as it was emerging from an oak dining-room suite sold by him 25 years ago.

A TENEBRIONID (Eleodes suturalis Say)

Wyoming. E. A. Back (September): The beetle was received on August 3 from a correspondent in Casper. Beetles were prevalent on the ground floor of a house without a cellar, and were annoying because of the odor they emitted when disturbed.

SILVERFISH (Lepisma saccharina L.)

Tennessee. E. W. Howe (September): We have had numerous complaints of annoyance from silverfish.

Mississippi. C. Lyle (September 24): Serious injury to clothing and wall paper by silverfish was reported in Okolona on September 11. Wall paper was also being damaged at Starkville and State College.



WEBBING CLOTHES MOTH (Tineola biselliella Hum.)

Nebraska. M. H. Swenk (September 23): Clothes moths were reported infesting upholstered furniture in Sherman County on August 29.

SPRINGTAILS (Collembola)

New York. E. A. Back (September): Springtails were received on August 16 from New York City, where they were reported to be very abundant in a new apartment house. They were first noticed on the outside window sills. They later invaded the entire apartment. From early in August to September 12 they were reported from a country home at Beaver Dam Lake, Salisbury Mills, where they were troublesome on the steps and window sills of a house.

# INSECT PEST SURVEY BULLETIN

Vol. 16

November 1, 1936

No. 4

## THE MORE IMPORTANT RECORDS FOR OCTOBER 1936

During the late fall egg laying of grasshoppers in Indiana and Illinois was so extensive that these States anticipate more severe injury than they have had in recent years. The same condition prevails in eastern Iowa.

Chinck bugs are generally abundant from Indiana westward to Kansas and Nebraska. The number of bugs entering hibernation indicates a large population next spring.

The corn ear worm developed so rapidly during the late fall that in October considerable damage was done from the Middle Atlantic States westward to the Mississippi River. Appreciable crop losses were also recorded from Oklahoma and Utah.

In the East Central States heavy populations of the codling moth are reported, making possible a heavy carry-over of this insect next spring. This insect was more prevalent on pears in Lake County, Calif., than ever before recorded.

Florida red scale infestations are heavier in Florida than at any time since 1934.

Late flights of the cotton leaf worm were reported from the East Central States northeastward to Maine and into Ontario, Canada.

A recent survey indicates that the smaller European elm bark beetle is now well established in an area approximately 100 miles in diameter in West Virginia and eastern Ohio.

The hemlock spanworm is rapidly increasing in Mount Desert Island, Maine, where it is attacking fir and spruce.

The eastern spruce beetle has destroyed the spruce over an area of between 300 and 900 acres in the Green Mountain National Forest, in Vermont.

The small bagworm, *Psyche nigrita* B. & McD., has been found infesting the recent plantings of tung-oil trees in Florida.

Reports of sporadic occurrence of screwworm infestations were received during October.

## NOTICE TO COLLABORATORS

Robert Glen, of the Canadian Entomological Branch, is spending several months at the National Museum, engaged in a study of elaterid larvae, particularly those belonging to the genus Lulius and allied groups. He would be pleased to receive on loan, for use in this study, any material which has been definitely associated with adults of these groups.

## THE MORE IMPORTANT FEATURES IN CANADA IN SEPTEMBER AND OCTOBER 1936

With the advent of autumn, the adult grasshopper populations in the Western Provinces declined rapidly and the outbreak terminated for this season. Egg surveys of the infested regions have proceeded, and indications point to continued severe outbreaks in many areas in 1937. In southwestern Manitoba, where, this year, the infestation of the lesser migratory grasshopper was more severe than was expected and where considerable damage was done, the 1937 outbreak threatens to be more severe than any during the last 5 years. A few small, lighter outbreaks will likely occur in central and eastern Manitoba. In Saskatchewan grasshoppers materially reduced the yields of feed grains and fodder throughout the infested region, and a very general and often considerable increase in the numbers of adult insects was noted as compared with the autumn of 1935. Furthermore, a marked spread into new localities was found to have occurred, with an increase of intensity in the drought-affected northwest. The outlook for 1937, in Saskatchewan, is considered rather unfavorable, as the outbreak will probably be considerably more severe generally in the prairie areas, and will extend farther into the northwest section. It appears that the roadside grasshopper will predominate in nearly all the more important outbreaks in this province in 1937. In Alberta grasshoppers caused damage to late grains and forage crops. Dry weather during the year was favorable to increase in many sections, and threatening outbreaks of the roadside and lesser migratory species are anticipated in 1937 in a number of areas, together with a northward extension of the affected region. In the Dry Belt area of British Columbia, where grasshoppers increased enormously during 1936, the outbreak prospects for 1937 indicate the need of a widespread control campaign to avert heavy losses.

An increased outbreak of the pale western cutworm is expected in 1937 in Saskatchewan and Alberta, where this species caused extensive losses to crops during the past season. The moth flight was about over by mid-September.

Wireworms caused serious and widespread damage to the potato crop over a wide area in Saskatchewan. Onions and gladioli also suffered attack. It is evident that conditions, at least in central and western parts of the Province, have been conducive to severe attack on various vegetable and flower garden plants by these insects.

Throughout much of the prairie area of Saskatchewan losses to wheat from attacks of the wheat stem sawfly were severe in fields where harvesting was delayed. Heavy losses occurred locally in Alberta.



Say's stink bug has been recorded from a number of points in Alberta and Saskatchewan, but has not yet caused economic damage.

Potato flea beetles were reported to be abundant in parts of Nova Scotia, Quebec, and Ontario, where they caused local injury. Potato aphids were scarce in eastern Ontario. Light-to-severe damage by the potato psyllid (*Paratrieza cockerelli* Sulc.) occurred in limited areas in Alberta and light infestations were found in several localities in Saskatchewan.

As usual, the imported cabbage worm effected material damage to cruciferous crops during the summer and autumn, throughout the Dominion.

The European corn borer was more prevalent in Ontario and Quebec than for a number of years. In Essex County, in southwestern Ontario, crop damage was reported greater than in any year since 1927. The infestation in eastern Ontario was also higher than it had been in the past.

The southern cowpea weevil was found at Trail, British Columbia, in a small shipment of cowpeas from Texas.

The gladiolus thrips has been found in a number of new localities in British Columbia, and appears to be spreading over the province.

Weather conditions in southern Ontario were favorable to the codling moth. Sideworm injury to apples was prevalent. In the Okanagan Valley, British Columbia, the lesser apple worm caused much damage to fruit.

Small numbers of larvae of the European spruce sawfly have been taken in Cumberland, Pictou, Antigonish, and Guysboro Counties, in Nova Scotia, but none were found on Prince Edward Island.

## GENERAL FEEDERS

### GRASSHOPPERS (Acrididae)

- Indiana. J. J. Davis (October 16): The population was greater in 1936 than for a number of years and there is reason to anticipate further increase in 1937. In August reports were received of injury to tomato fruits and all kinds of garden plants, as well as to new alfalfa and corn. Reports and observations in September indicate an abundance of immature grasshoppers, which are likely to be destructive to wheat this fall.
- Illinois. W. P. Flint (October 19): A few preliminary examinations for eggs show them to be very numerous, probably at least three times as abundant as in the fall of 1935.
- Wisconsin. E. L. Chambers (October 23): Following heavy rains about the last week of August, adults of all species became very scarce everywhere. The egg survey revealed few eggs laid in most of the areas where heavy damage occurred last summer.
- Tennessee. E. A. Beck (October 13): The lesser migratory locust (Melanoplus mexicanus Say.) was received today from Bristol, where it was said to be invading a furniture store and eating holes in the furniture covers.
- Iowa. C. J. Drake (October 21): The adult grasshopper survey was completed a few weeks ago and an egg survey is now being made. The outlook for next year is very serious.
- Missouri. L. Haseman (October 21): During the month egg laying has been in progress but the weather has been unfavorable for it and our state-wide survey indicates that over most of the State egg laying has been considerably below normal. M. bivittatus Say and M. differentialis Thos. are now practically all gone, but M. femur-rubrum and M. mexicanus continue to be present in limited numbers and the females are still carrying eggs.
- North Dakota. F. Gray Butcher (October 27): Observations on grasshopper eggs indicate a somewhat lighter infestation over the State in general; however, the western part of the State and some southern counties have menacing egg populations. M. mexicanus is the predominant species and M. femur-rubrum, M. packardii Scudd., M. bivittatus, and Camnula pellucida Scudd. are represented by smaller numbers.
- Kansas. H. R. Bryson (October 5): Notwithstanding the increased population of grasshoppers during the past summer, very few reports of injury to fall-corn wheat have been received.
- Nebraska. M. H. Suenk (October 15): Grasshoppers were troublesome about young alfalfa and early wheat fields from September 30 to October 15, but especially so up to September 30.
- Oklahoma. C. F. Stiles (October 21): The long winged grasshopper (Dissoste-

longipennis Thos.) is seriously damaging the early sown wheat just coming up in Texas and Comanche Counties. Approximately 180 tons of poison bait has been distributed this month in these two counties with fair results, as the hoppers continue to come in from the dry pastures and the young wheat is the most attractive food at this time. There has been practically no damage from other species so numerous early in the season.

F. A. Fenton (October 22): The differential grasshopper (M. differentialis) is now laying eggs. This species still continues to be active in Payne, Pawnee, and neighboring counties. Some damage is being done to young wheat. In the southwestern part of the State surveys indicate comparatively little egg deposition.

#### FALL ARMYWORM (Laphygma frugiperda S. & A.)

Virginia. H. G. Walker (October 26): The fall armyworm has continued to be destructive to spinach and rye at Norfolk.

South Carolina. C. F. Rainwater (September): Numerous complaints were received at the Pee Dee Experiment Station at Florence of damage to soybeans by L. frugiperda and Anticarsia gemmatilis Hbn. The fall armyworm is the more abundant. This is the third successive year these complaints have been received.

Ohio. T. H. Parks (October 24): Considerable damage was being done late in October by larvae feeding on sweet corn in the University gardens at Columbus.

J. S. Houser (September 30): Several damaged stalks of late corn sent in from New Philadelphia. Numerous larvae, ranging in length from  $\frac{1}{8}$  inch to  $1\frac{1}{4}$  inches, were present.

Missouri. L. Haseman (October 21): Although in central Missouri I have seen very little of this pest on alfalfa and other crops, we have had several complaints from the southern part of the State.

Mississippi. C. Lyle (October 24): Serious injury to gladioli by the fall armyworm was reported on September 25 from Jackson.

#### CLOUDLESS SULPHUR (Catopsilia eubule L.)

Florida. G. B. Merrill (October 23): During the week beginning Labor Day there was a considerable southward flight of cloudless sulphur on Lake Santa Fe, near Waldo.

#### GULF COAST FRITILLARY (Dione vanillae L.)

Florida. G. B. Merrill (October 23): There was a considerable flight of the Gulf Fritillary on Lake Santa Fe, near Waldo, during the week beginning Labor Day.



WHITE GRUBS (Phyllophaga spp.)

Kansas. H. R. Bryson (October 24): One field of wheat at Manhattan was injured considerably by white grubs. The grubs were active also in strawberry beds in northeastern Kansas. A report from Hazelton indicates that E. Leconte Say had cut off wheat plants.

CEREAL AND FORAGE - CROP INSECTS

WHEAT

HESSIAN FLY (Phytomyza destructor Say)

Ohio. T. H. Parks (October 24): The present hessian fly situation is quite satisfactory.

Indiana. C. M. Packard (October 20): Fall infestation of down wheat now appears to be very light in northern Indiana. Light-to-moderate infestation present in volunteer, where small-to-mature larvae and many puparia are now present. There was a light emergence of adults from volunteer early in October.

Missouri. L. Hootman (October 21): Summer flaxseeds on recent check-ups throughout southeastern, northeastern, northwestern, and central Missouri indicate considerable parasitization and mortality, probably due to excessive summer heat. Rain and cool weather late in September and throughout October have given the hessian fly a further setback. Present indications are that we will have less fly on the next crop of wheat than we have had for several years past.

Kansas. H. R. Bryson (October 24): Hessian fly is present in the vicinity of Abilene and Junction City, and in southeastern Kansas.

CHINCH BUG (Blissus leucopterus Say)

Indiana. J. J. Davis (October 16): The second generation of chinch bugs increased to threatening numbers and in some localities caused noticeable damage to corn. The hibernating bugs are sufficiently numerous to offer a threat for next spring.

C. Benton (October 20): In the vicinity of Lafayette most of the bugs have become adult. Scattered field observations indicate that the bugs are moderately abundant in northwestern Indiana, but scarce in the northeastern part of the State.

Illinois. W. B. Flint (October 19): Chinch bugs have reached maturity in a majority of the State except the northern part and are already in winter quarters in most of the area. Judging by preliminary examinations, bugs are about as abundant in southern Illinois as they were in the fall of 1933.

Iowa. C. J. Drake (October 21): Chinch bugs are very abundant in the southern part of the State.

Missouri. L. Haseman (October 21): Recent surveys indicate the lowest fall population for several years.

Kansas. H. R. Bryson (October 24): Chinch bugs are numerous at Manhattan, where two or three flights have occurred since October 1, but the situation is not alarming.

Nebraska. M. H. Swenk (October 15): Chinch bugs were numerous in Nemaha County cornfields at least up to September 21, the date of the last inquiry.

### CORN

#### CORN EAR WORM (*Heliothis obsoleta* F.)

South Carolina. F. Sherman and associates (October): Noticeable riddling of tops in late corn by corn ear worm, yet not as bad as might have been expected with the crop so late.

Indiana. E. V. Walter (October 20): All stages of corn ear worm now present at Lafayette. They are mainly in late corn, which averages 80 percent or more of the ears infested. Limited field observations indicate progressively lighter infestations toward the northeastern part of the State. Counts in late-maturing fields near Auburn and Fort Wayne showed about 30 to 35 percent of the ears infested.

Illinois. W. F. Flint (October 19): A severe infestation extended over the southern third of the State, the worms causing considerable damage by eating beans out of the soybean pods, destroying new seedlings of alfalfa, and feeding on old alfalfa seedlings. There was a heavy flight of adults in the central part of Illinois on warm evenings early in October.

Kentucky. W. A. Price (October 24): Corn ear worms ruined much of the late corn. Many fields where the plants came into tassel late in September and early in October were completely ruined.

Iowa. C. J. Drake (October 21): The corn ear worm has been unusually abundant this fall. In some fields it is almost impossible to find uninfested ears. The infestation is general over the State.

Missouri. L. Haseman (October 21): With practically no acreage of corn escaping the summer drought and with very little late sweet corn, the corn ear worm has again attracted attention on alfalfa, similar to the injury in 1934. Again the green variety of larva has been especially prominent.

Oklahoma. F. A. Fenton (October 22): No late corn was planted this year and the corn ear worm is scarce, an occasional larva being found in sorghum buds. On cotton, however, this species appears to be moderately abundant.

most of the larvae being about one-third grown.

Utah. E. F. Knowlton (September 29): Corn ear worm has been reported doing injury in Beaver, Juab, Millard, Washington, Uintah, Sevier, Iron, Wasatch, and Salt Lake Counties.

SOUTHWESTERN CORN BORER (Diatraea grandiosella Dyar)

Texas. F. L. Brown (October 14): Specimens of D. grandiosella sent in on August 7 from corn raised near Tahoka, Lynn County. This is the first record from that county.

SOYBEANS

VELVETBEAN CATERPILLAR (Anticarsia gemmatilis Hbn.)

Mississippi. C. Lyle (October 24): The velvetbean caterpillar had stripped nearly all of the soybeans in the vicinity of State College by October 15. Inspector J. P. Kislanko reports that the insect was causing heavy defoliation of soybeans in Perry and Jones Counties on October 17.

Georgia. F. L. Russell (November 2): Very numerous on alfalfa at Dalton.

CRETALARIA

FELIA MOON (Utetheisa bella L.)

Alabama. J. M. Robinson (October 23): This insect is generally distributed over the State and is causing concern, since the newly introduced locust, crotalaria, has proved a most suitable food plant. At the sub-station on Sand Mountain larvae defoliated a whole planting of the locust. Larvae feed on soybean (Pasiflora incarnata) early in the season and later attack the foliage of crotalaria.

F R U I T I N S E C T S

FLAT-HEADED APPLE TREE BORER (Chrysobothris femorata Oliv.)

Maryland. E. H. Cory (October 2): Cherries at Westminster have been attacked by the flat-headed apple tree borer.

Ohio. E. W. Mendenhall (October 14): The flat-headed borer is injuring mountain ash trees in a nursery near Newark.

Nebraska. M. H. Swenk (October 15): Reports of damage to plum, apple, and cherry and to elm and other shade trees were received from Lancaster, Saline, Platte, Thayer, Antelope, Hall, and Harlan Counties from September 20 to October 15.

Oklahoma. F. A. Denton (October 22): We have received requests concerning damage by the flat-headed apple tree borer.



SAN JOSE SCALE (Aspidictus perniciosus Const.)

West Virginia. F. W. Craig (September 29): San Jose scale is attacking lilac branches at Fairmont.

Georgia. C. I. Snapp (October 17): Infestation on peach trees at Fort Valley built up rapidly last month and its extent is now about that of an average year.

Ohio. E. W. Mendenhall (October 22): San Jose scale is found in some commercial apple orchards in Licking County. In some localities it spread during the summer.

Illinois. W. P. Flint (October 19): In the central part of Illinois nearly all the San Jose scale was killed by the severe winter, but a light infestation is developing mainly on the trunks of the trees, very little extending to the tops and outer branches.

APPLE

CODLING MOTH (Carpocapsa pomonella L.)

Georgia. C. H. Alden (October 17): The last moth emerged September 29 at Cornelia. No egg laying or fresh stings noted in the past 2 weeks. All larvae leaving apples and spinning up winter cases.

Ohio. T. H. Parks (October 24): There will be a heavy carry-over of larvae in the two seriously affected areas, Lawrence County in the south, and Lucas and Ottawa Counties in the north. Eighty orchards visited by extension agents showed an average of 89.5 percent clean fruit and 5.6 percent blemished by codling moth.

Indiana. J. J. Davis (October 16): Infestation heavy in southern Indiana and in some orchards in the northeastern section.

North Dakota. J. A. Munro (October 27): Light infestation of larvae in crabapples observed at Fargo.

Missouri. L. Haseman (October 21): Where a regular schedule of sprays was applied we will have the lightest carry-over of worms that has occurred in Missouri for the last 5 or 6 years. However, in orchards where but few applications were made worms are abundant in the bands.

California. S. Lockwood (October 7): Codling moth was responsible for greater loss this year than ever before in the big valley district in Lake County. Inspections of pear trees indicate that there is apt to be a very heavy winter carry-over of hibernating larvae.

RED-HUMPED CATERPILLAR (Schizura concinna S. & A.)

Maine. H. B. Peirson (October): Reported stripping foliage of apple at Greenville on September 8.

SHOT-HOLE BORER (Saclytus rugulosus Ratz.)

Ohio. T. H. Parks (October 24): On October 12 we received a report of serious injury from shot-hole borers to a 12-year-old apple orchard at Hamilton, in Butler County. This county was in the heart of the drought and the shot-hole damage has evidently followed in the wake of the drought.

APPLE MAGGOT (Rhagoletis pomonella Walsh)

Connecticut. P. Gorman (October 23): More abundant than last year but about average, as compared with the usual infestation. Infested apple fruit has recently been received from Elmwood, Meriden, and New Haven.

PEACH

PEACH BORER (Carpocapsa exitiosa Say)

Georgia. O. I. Shapp (October 17): Emergence of moths at Fort Valley was practically completed by September 25, earlier than usual. More paradichlorobenzene is being used this fall than for a number of years. This is attributed largely to the good profit made by Georgia growers out of the crop this year. Many growers resort to worming the trees during spring when profits are low.

C. H. Alden (October 17): Growers have finished applying paradichlorobenzene in the northern section of the State. Some of them did not use the chemical because of the lightness of the infestation.

Ohio. E. W. Mendenhall (October 2): The peach borer was found to be serious in peach-tree stock in a nursery at Frazeytsburg.

Nebraska. H. E. Stenk (October 15): From Lancaster County on September 25 came a report of peach trees being attacked.

ORIENTAL FRUIT MOTH (Granolitha molesta Fusch)

Ohio. T. H. Parks (October 24): Larvae were common in apples being harvested in small orchards in the eastern part of Lucas County the middle of October. About 25 percent of the larvae found within the apples was oriental fruit moth, the remainder being codling moth. Nearly all of the larvae found in pears were oriental fruit moth. Oriental moth larvae were also common in apples in one Delaware County orchard, where peach trees were interplanted.

Mississippi. C. Lyle (October 24): Complaints and specimens of peach trees injured by this pest were received from Staens and New Albany on October 8.

GRAPE

GRAPE LEAF FOLDER (Desmia funeralis Hbn.)

California. S. Lockwood (October 7): The grape leaf folder has been especially abundant in the vineyards near Exeter, Tulare County, and Parlier, Fresno County. Some damage has been done.

PECAN

TWIG GIRDLER (Oncideres cingulatus Say)

Georgia. C. H. Alden (October 17): Many complaints of injury by the hickory twig girdler to pecan twigs at Cornelia have been received.

Florida. J. R. Watson (October 22): The hickory twig girdler did its usual damage to hickory, pecan, and "Australian pine", and some damage to persimmon and pear.

Mississippi. C. Lyle (October 24): The hickory twig girdler is reported by Inspector N. D. Peets, of Brookhaven, as causing slight damage to pecans in southwestern Mississippi. Twigs containing young larvae were found at State College on October 20. A wisteria twig cut off by this insect was received from Trebloc on October 1.

PECAN WEEVIL (Curculio caryae Horn)

Alabama. J. M. Robinson (October 28): Larvae were observed leaving pecans in central Alabama during the week beginning October 18.

HICKORY SHUCK WORM (Laspeyresia caryana Fitch)

Mississippi. C. Lyle (October 24): A complaint of the hickory shuck worm was received from Meridian on October 6. Many infested pecans were found at State College on October 20. A heavy infestation is reported by Inspector G. L. Bond at Moss Point. Many of the nuts dropped before maturity, and many of those remaining on the tree have not filled out.

BLACK PECAN APHID (Melanocallis caryaefoliae Davis)

Mississippi. C. Lyle (October 24): The black pecan aphid is heavily infesting some orchards in the vicinity of Meridian, according to Inspector M. L. Grimes. Inspector J. E. Lee, Poplarville, reports it less abundant than in previous years.

CITRUS

CITRUS WHITEFLIES (Dialeurades spp.)

Mississippi. C. Lyle and assistants (October 24): Whiteflies (D. citri Ashm.) are numerous on ornamental shrubbery in nearly all parts of the State.



Texas. S. W. Clark (October 14): All stages of *D. citrifolii* Morg. were present on Citrus at Mercedes, Hidalgo County, on September 15.

FLORIDA RED SCALE (*Chrysomphalus aspidum* L.)

Florida. H. Spencer (October 1): Infestation of citrus trees by the Florida red scale is heavier than at any time since the December freeze in 1934. Some small trees are being defoliated. On grapefruit now ripening the adult scales are quite conspicuous.

Texas. S. W. Clark (October 14): Many crawlers and young scales are present at Mercedes, Hidalgo County, on citrus.

CALIFORNIA RED SCALE (*Chrysomphalus aurantii* Mask.)

Texas. S. W. Clark (August 14): Infestations of California red scale, most common at McAllen and Mission, are rare and very spotted.

PURPLE SCALE (*Lepidosaphes loebli* Journ.)

Florida. H. Spencer (October 1): A season of frequent rains and high humidity during August and September has aided in natural control of purple scale by favoring the development of the red-headed fungus, which is very noticeable now. In some groves that have received heavy applications of sulphur mixtures which left heavy residues on the leaves, purple scale infestations have increased this season.

COTTONY-CUSHION SCALE (*Icerya purchasi* Mask.)

Southwestern States. E. W. Barrer and G. B. Merrill (October 23): Outbreak of cottony-cushion scale continues in unusual numbers. This is indicated by the number of requests for Volatic Beetles. During October 31 colonies of 10 beetles each have been supplied to growers in Florida, some of the other Gulf States, North Carolina, and South Carolina. During the last fiscal year 270 colonies were supplied.

LEAF-FOXTED FLY (*Lestodiplosis phyllopus* L.)

Texas. F. L. Thomas (October 14): Causing considerable injury to satsumas at Beaumont, in Jefferson County, also in Dimmit County, in the Winter Garden region, as reported by S. W. Clark and M. J. James.

CITRUS RUST MITES (*Phyllopterus oleivorus* Ashm.)

Florida. H. Spencer (October 1): Citrus rust mites have been somewhat less numerous this year than in 1935. As is usual during August and September, rust mites in unsprayed and undusted groves almost disappeared, but not until much russetting of fruit had occurred. In groves sprayed or dusted with sulphur there was more red scale and spray burn of unopened fruit than usual. Coordinated efforts toward improvement of quality of fruit by control of pests and other means has noticeably increased the proportion of fruit that will make first grade.

A MITE (Anychus clarkii McG.)

Texas. S. W. Clark (August 10): Very few mites (A. clarkii) can be found on citrus at this time around Weslaco.

TRUCK - CROP INSECTS

CORN EAR WORM (Heliothis obsoleta F.)

Maryland. G. Myers (October): Late sweet corn on my farm 2½ miles east of Rockville is badly infested by the corn ear worm.

Florida. J. R. Watson (October 22): In Manatee County there was considerable damage on bell peppers.

F. S. Chamberlin (September): The corn ear worm has been causing considerable damage to string beans at Quincy.

Ohio. E. W. Mendenhall (October 15): Corn ear worm is quite bad and injurious to the late sweet corn in Ohio, rendering some ears unsalable.

T. H. Parks (October 24): Late sweet corn has been seriously infested. Moths of corn ear worm on the wing during October.

Indiana. J. J. Davis (October 16): Corn ear worm increased to conspicuous numbers in corn and tomatoes in the southern half of the State the latter half of September.

G. E. Gould (October 20): Corn ear worms have been exceedingly numerous around Lafayette, where damage to late sweet corn, tomatoes, green beans, and peppers was noted.

Tennessee. G. M. Bentley (October 15): The corn ear worm continues serious, especially on sweet corn in various parts of the State.

Mississippi. C. Lyle and assistants (October 24): Severe damage to fall tomatoes in Franklin County. Fall plantings of bunch beans in Jones County were heavily infested. This worm is less abundant on tomatoes than it was last month in Pearl River County.

Texas. J. N. Rensy (September): H. obsoleta caused damage in Galveston, Wharton, and Collins Counties throughout September, attacking cotton and tomatoes.

Utah. G. F. Knowlton (September 29): Tomato fruitworm injury was moderate to light in Weber, Uintah, Iron, Cache, Box Elder, Davis, Utah, and Salt Lake Counties.

Washington. C. E. Woodworth (September 30): These caterpillars are destroying large numbers of zinnia blossoms at Walle Walle by burrowing in the flowers and flower stalks.

California. A. E. Michelbacher (October 19): Serious damage is being done to tomatoes by the corn ear worm in several localities in central California. A survey of Sacramento and Yolo Counties on September 27 and 28 showed the infestation in general to range from 2 to 8 percent. In a small field near Sacramento 24 percent of the fruit was infested, a small extent of the damage in this field being caused by the larvae of the corn root worm (*Diabrotica* sp.). In a number of the fields around the infestation was apparently increasing. In the San Francisco Bay District infestations as high as 25 percent have been reported in two fields. The infestation continues high and there are many fields in which 10 percent or more of the fruit is damaged. In the Central and District the corn ear worm infestation has been rather small, although it is increasing rather rapidly. Many small worms are showing up and the infestation may exceed 10 percent in some fields.

SOUTHERN PEAR WORM (Anthonomus pomorum L.)

South Carolina. C. C. Davis (October 18): Garden plots having the tops also heavily damaged by the southern pear worms were brought to the attention of the commercial planting at Charleston. Numerous worms were seen on the entire defoliated. This insect is more abundant than usual.

CUCUMBER BEETLES (Diabrotica spp.)

Missouri. L. H. Hays (October 21): During the first half of the month the striped cucumber beetle (*D. vittata*) and the spotted cucumber beetle (*D. undecimnotata* F.) were more abundant than I have seen them in previous years, but during the latter half of the month they have been less abundant, presumably beginning to migrate to winter quarters.

Mississippi. J. B. Lee (October 24): *D. vittata* and *D. undecimnotata* were fairly abundant on fall cucumbers and less numerous on late beans in Lamar County.

SOUTHERN GREEN STINKBUG (Nezara viridula L.)

Florida. J. B. Watson (October 20): The southern green stinkbug has been scarce rather than abundant at this time of year. Parasitization by *Triclistus* sp. runs as high as 50 percent. This seems to hold for the entire peninsula.

Texas. F. L. Thomas (October 14): Fifty heads of hogari examined: 121 adults and nymphs; very active; 10 percent. Found on hogari at Cameron, Milam County, and on vegetables in Hill and Gregg County, October 7.

FALSE COTTON WORM (Pectinophora gossypiella L.)

Georgia. F. L. Mitchell (October 23): Leaves of turnip growing by the Flint River near Milledgeville, Meriwether County, are heavily injured by adults of a small fly believed to be *N. oriana*.



Mississippi. J. P. Kislanko (October 24): The false chinch bug is unusually abundant and causing serious injury to turnips in Stone, Forrest, and Jones Counties.

POTATO AND TOMATO

EUROPEAN CORN BORER (Pyrausta nubilalis Hbn.)

Connecticut. N. Turner (October 17): Potato vine infestation in six towns of Hartford and Tolland Counties ranges from 5 to 95 percent. Fifty-three acres having from 70 to 100 percent infestation showed a reduction in yield. One grower estimated at least 1,800 bushels loss on 18 acres of Green Mountains. Both first- and second-generation infestation occurred. All these fields were in the heart of the newly developed potato-growing district in Connecticut.

TOMATO PINWORM (Gnorimoschema lycopersicella Busck)

California. A. E. Michelbacher (October 19): Three larvae of the tomato pinworm have been collected in the San Francisco Bay district. The first one was taken at San Jose, the second at Santa Clara, both in Santa Clara County, and the third at Hayward, Alameda County. (Two previous reports from this district in Insect Pest Survey files are from Marin County in 1931 and from Santa Cruz County in 1935.)

POTATO TUBER WORM (Gnorimoschema operculella Zell.)

Utah. G. E. Knowlton (October 10): Very little injury has been observed or reported in the section of Utah infested with the potato tuber worm.

California. A. E. Michelbacher (October 19): There is a light infestation of larvae in the tomato fields in the San Francisco Bay district. Generally, less than 1 percent of the tomatoes are infested.

TOMATO WORMS (Protoparce spp.)

Indiana. J. J. Davis (October 16): Tomato worms have been quite abundant in tomato fields in Indiana, attacking fruit and foliage.

COLORADO POTATO BEETLE (Leptinotarsa decemlineata Say)

Tennessee. G. M. Bentley (October 6): There has been a surprisingly small number of Colorado potato beetles this year. In the 13 commercial potato-growing counties of the State very few have been found on the first and second crops.

CARROT BEETLE (Ligyrus gibbosus Deg.)

Oklahoma. C. G. Hatcher and C. F. Stiles (August 17): In tomato roots and feeding in tomato fruits at Cherokee.

### WIREWORMS (Elateridae)

Ill. H. Turner (October 17): In a 3-acre field of potatoes in the Mississippi River Valley there was a loss of 200 bushels per acre (about 400), on account of wireworm damage of tubers. The pest was probably Limoni ectypus Say.

### TOBACCO FLEA BEETLE (Epitrix parvula F.)

Tex. S. W. Clark (August 11): Damage by E. parvula reported in practically all tobacco seed beds at Weslaco.

### A LEAFHOPPER (Empusa callosa DeLong)

Calif. R. E. Campbell (October 24): This leafhopper was very abundant in several potato fields in Los Angeles and San Bernardino Counties. The plants had a generally unhealthy appearance and growth was not what it should have been, but it was impossible to determine whether the leafhoppers were the sole cause of the injury. (Det. F. W. Oman.)

### POTATO LEAFHOPPER (Empusa fabae Harr.)

Mass. G. M. Bentley (October 23): Potato leafhopper, one of our outstanding potato pests, has been very prevalent on both plantings of the Irish potato crop.

Tex. J. M. Roney (September 15): E. fabae causing severe injury to lima beans and black-eyed peas in Galveston County.

### TOMATO PSYLLID (Paratrioza sacknerelli Sulz.)

Utah. G. F. Knowlton (September 29): Potato psyllid injury was reported from Sevier, Wasatch, Piute, Garfield, Tooele, Washington, Kane, Weber, and Uintah Counties. Damage this year was much less extensive than in 1915.

### BEANS

#### BEAN LEAF ROLLER (Coniurus proteus L.)

Florida. F. S. Chamberlin (September): The bean leaf roller is causing some damage to string beans at Quincy.

#### BEAN THRIPS (Heliothrips fasciatus Perg.)

Utah. G. F. Knowlton (September): Injury to bean foliage by thrips was reported from Iron, Weber, and Uintah Counties.

## CABBAGE

### IMPORTED CABBAGE WORM (*Ascia rapae* L.)

Virginia. H. G. Walker (October 26): The imported cabbage worm is relatively scarce in the Norfolk district.

Indiana. G. E. Gould (October 20): Cabbage worms have been unusually destructive this fall and are still feeding on the late cabbage crop.

Tennessee. G. M. Bentley (October 21): Comparatively few imported cabbage worms have been present on cabbage, brussels sprouts, and cauliflower.

Missouri. L. Haseman (October 21): The imported cabbage butterfly has been quite abundant, ovipositing on late cabbage, turnips, and related crops. Late cabbage has been severely attacked throughout central Missouri.

Utah. G. F. Knowlton (October 12): Cabbage worms seriously damaged cabbage and cauliflower in various parts of Tooele County. (September 29): Cabbage worm injury has been reported from Garfield, Wasatch, Grand, Beaver, Sevier, Morgan, Weber, Millard, Cache, Uintah, Iron, Salt Lake, and Piute Counties.

### SOUTHERN CABBAGE WORM (*Ascia protodice* B. & L.)

Georgia. T. L. Bissell (October 10): Caterpillars are destructive to turnip and collard at Experiment and Clarkston.

Kentucky. W. A. Price (October 24): Southern cabbage worms are abundant at Lexington.

Missouri. L. Haseman (October 21): The native cabbage butterfly has been quite abundant, ovipositing on late cabbage, turnips, and related crops. Late cabbage has been severely attacked throughout central Missouri.

Mississippi. C. Lyle (October 24): The southern cabbage worm was damaging turnips at Starkville on October 15.

### CABBAGE LOOPER (*Antographa brassicae* Riley)

New York. M. D. Leonard (October 15): The cabbage looper has been abundant and destructive on the large commercial crop of cauliflower on Long Island. It was apparently much more abundant than the imported cabbage worm but, with a change to cooler weather about the first of October, the infestation has eased off and apparently control measures are, in general, no longer necessary.

Virginia. H. G. Walker (October 26): A disease has been keeping cabbage loopers in check at Norfolk, therefore damage to collards, kale, and cabbage has been very light.

Florida. J. R. Watson (October 22): The cabbage looper was extremely abundant



in the Bradenton section of Manatee County.

Illinois. G. E. Gould (October 20): Cabbage loopers were destructive in Illinois and Iowa in September but were checked later by bacterial disease.

Missouri. L. Sherman (October 21): Cabbage loopers have been abundant, associated with certain cabbage worms on cabbage and related crops during the month.

Mississippi. C. Lytle (October 24): The cabbage looper was causing severe damage to rutabagas on September 24 at Florence.

#### DIAMONDBACK MOTH (Plutella maculipennis Curt.)

Tennessee. G. M. Bentley (October 23): Three years ago the diamondback was very abundant in our commercial cabbage-growing sections of western Tennessee, being brought in primarily on plants purchased out of the State. During the last 2 years the growers would not accept plants with the diamondback moth and, as a result, there has been no apparent injury from it this year.

Virginia. H. G. Molder (October 24): The larvae have been very destructive to rutabaga and collard fields during the past month.

#### CABBAGE APHID (Brevicoryne brassicae L.)

Virginia. H. G. Molder (October 2 ): The cabbage aphid is rather scarce at present but is increasing and may cause some damage under favorable weather conditions.

Utah. G. E. Hewlton (October 12): Cabbage aphids were abundant and damaged cabbages in various parts of Wasatch County.

#### HARLEQUIN BUG (Harmonia histrio Hahn)

South Carolina. F. Sherman and associates (October 20): Considerable complaint of harlequin bug from the eastern section. J. G. Watts reports finding this bug abundant on shepherd's-purse weed.

Tennessee. G. M. Bentley (October 23): Only a few complaints of the harlequin bug have been reported.

Mississippi. C. Lytle (October 24): The harlequin cabbage bug is present in small gardens throughout the State, especially on fall collards and mustard.

#### MELONS

##### MELON APHID (Aphis gossypii Glov.)

Indiana. J. J. Davis (October 1-): Melon aphid reported very abundant in northern Indiana the last of August.

Missouri. L. Haseman (October 21): During the month there has been a progressively increasing invasion of melon aphid on cucumbers, squash, and pumpkins throughout central Missouri, with a decrease in numbers of ladybeetles, lace-wings, and hymenopterous parasites attacking it.

### SQUASH

#### SQUASH BUG (Anasa tristis Deg.)

Missouri. L. Haseman (October 21): During the month the squash bug has been on the increase and most of them are now transforming to the adult stage, preparatory to seeking winter quarters.

Kansas. H. R. Bryson (October 24): On account of the dry weather during the latter part of the summer, the injury to squashes and pumpkins by the squash bug was quite marked.

### TURNIP

#### TURNIP APHID (Rhopalosiphum pseudo brassicae Davis)

Virginia. H. G. Walker (October 26): The turnip aphid has been very abundant in cabbage seed beds this fall at Norfolk.

Indiana. J. J. Davis (October 16): Turnip aphids were abundant and destructive to turnips in the eastern part of the State during September.

Kentucky. W. A. Price (October 24): Turnip aphids have been reported in destructive numbers from Waynesburg and Louisville.

### SPINACH

#### GREEN PEACH APHID (Myzus persicae Sulz.)

Virginia. H. G. Walker (October 26): The spinach aphid is from scarce to moderately abundant on kale and collards but very scarce on spinach at Norfolk.

#### BEET LEAFHOPPER (Eutettix tenellus Bak.)

Texas. M. J. James (October 19): The first specimen of beet leafhopper this fall was taken on a screen trap on October 12. Last winter and early in the spring this insect and the virus disease it transmits caused severe injury to spinach in the Winter Garden district of Texas.

### STRAWBERRY

#### STRAWBERRY LEAF ROLLER (Ancyliis comptana Freel.)

Ohio. E. W. Mendenhall (October 16): Leaf rollers were quite bad in some strawberry plantations at Miami, in Clark County, but where continued spraying or dusting was carried on the rollers were kept down to minimum.

Utah. G. F. Knowlton (September 29): Strawberry leaf roller injury is reported from Wasatch, Juab, and Uintah Counties.

STRAWBERRY ROOT APHID (Aphis forbesi Weed)

Tennessee. G. M. Bentley (October 23): There has been a very heavy infestation of the strawberry root louse on the roots and leaf petioles of strawberry plants in some fields.

SWEETPOTATO

SWEETPOTATO WEEVIL (Cylas formicarius F.)

Texas. J. N. Roney (September): Weevils abundant during September in Galveston County.

TOBACCO

TOBACCO WORMS (Protoparce spp.)

Tennessee. G. M. Bentley (October 23): P. sexta Johan and P. quinquemaculata Haw. have been very prevalent in all the tobacco-growing counties of this State. The two species occur in about equal numbers.

Florida. F. S. Chamberlin (September): Tobacco hornworms (P. sexta) are very scarce at Quincy.

TOBACCO FLA BEETLE (Epitrix parvula F.)

Florida. F. S. Chamberlin (September): Tobacco flea beetles appear to be going into winter quarters at Quincy.

C O T T O N I N S E C T S

PINK BOLLWORM (Pectinophora gossypiella Saund.)

Texas. R. E. McDonald (October 19): The most important news of the week was the finding of the pink bollworm in the Western Extension of Texas. On October 13 two larvae were found in gin trash at Midland, Midland County, and two more on October 15. The last specimens previously found in Midland County were in the 1934 crop. On October 14 two specimens were found in trash from a local gin at Big Spring, in Howard County, and on the following day another specimen was found. Howard County was previously in the regulated area, the last infestation being in the 1927 crop.

A. J. Chapman (October 3): At Presidio boll-infestation counts were made in 15 fields during the week and the average infestation was 97.73 percent, with an average of 3.8 bolls per plant. The average infestation in eight of these fields last year was 97 percent, or an average of 5.2 bolls per plant, as compared to 98.75 percent with an average of 3.3 bolls per plant, this year. (October 24): Practically all fields in



the valley are now infested 100 percent.

Mexico. C. S. Rude (October 20): At Tlahualilo the infestation remains high, the number of worms per boll being more because of the relatively small number of green bolls.

COTTON LEAF WORM (Alabama argillacea Hbn.)

Canada. Canadian Insect Pest Review (September 30): Several specimens of the cotton leaf worm have been taken recently in light traps at Queenston, Ontario. (See vol. 14, no. 4, p. 100.)

Maine. H. F. Peirson (October): Cotton leaf worm has appeared in several flights at lights from September 9 to 23 at Bar Harbor. Reported by A. E. Brower.

Virginia. C. R. Willey (October 13): Flight of moths in Norfolk the night of October 8. Hundreds of moths on buildings and especially on large show windows.

Chic. T. H. Parks (October 24): Moths were common at lights about Columbus during October.

J. S. Houser (October 9): The evening of October 7 a considerable number of moths invaded the downtown area of Worcester, attracted by the street lights. Next day they came in increased numbers and during the 9th the upper parts of the lamp posts were completely covered, also parts of store and restaurant windows. Have never before seen such an extensive flight. Certainly several hundred thousand moths were clustered today in the downtown area.

H. Bennett (October 9): There are millions throughout the city of Akron. (Det. by J. F. G. Clark.)

Indiana. J. J. Davis (October 16): This moth has been reported as abundant in several parts of Indiana. At Wabash on September 8, the moths were injuring grapes. Early in September some cotton plants growing in the experimental garden at Lafayette were defoliated by caterpillars, eggs having evidently been laid by the migrating moths the last of August.

E. V. Walter and associates (October 8): Large numbers of adults suddenly appeared around lights at Lafayette today.

Illinois. W. P. Flint (October 19): Heavy flights of moths in central and north-central Illinois during the past 2 weeks.

BOLL WEEVIL (Anthonomus grandis Boh.)

Georgia. P. M. Gilmer (October 17): In southern Georgia the boll weevil is present in all fields yet unplowed, but the concentration is low and the number that will enter hibernation is less than in previous years, as cotton has been so defoliated by the cotton leaf worm that there are

neither leaves nor squares for feeding and breeding.

Mississippi. H. C. Young (October 17): In Oktibbeha County the population is about the same as last season, which was below normal, and the number to enter hibernation will be very small. Extremely dry weather during September and October, together with the leaf worm, has prevented the building up of a large weevil population.

Louisiana. R. C. Gaines (October 24): Reporting on boll weevils taken on nine flight screens at Tallulah, in comparison with the 2 previous years in the same dates shows the following variations:

Date	: 1934 :	1935 :	1936
	: Number :	Number :	Number
October 3.....	18 :	19 :	8
October 10.....	41 :	24 :	24
October 17.....	31 :	40 :	6
October 23.....	93 :	34 :	7

Adult weevils cannot be found in great numbers in this locality and, as there is practically no feeding material, it is apparent that there will be a small number of weevils to enter hibernation.

Texas. R. W. Moreland (October 17): In Brazos and Burleson Counties, in collecting weevils for first installation of hibernation cages, it was difficult to locate a cotton field that had not been stripped by leaf worms.

X. P. Ewing (October 17): In Calhoun County the boll weevils are continuing to breed in the late-squaring cotton, but favorable conditions for hibernation are being lessened by leaf worms stripping the cotton.

Mexico. C. S. Hale (October 20): The boll weevil is very abundant over the whole Laguna. In most places the top crop is almost a total loss.

#### THURBERIA WEEVIL (*Anthonomus grandis thurberiae* Pierce)

Arizona. W. A. Stevenson (October 17): In Pima County in making the annual fall examinations for insect damage to cotton bolls, a 0.2-percent infestation of *Thurberia* weevils was found in one field about 6 miles south of Tucson.

#### A BEETLE (*Colaspis* sp.)

Arizona. T. P. Cassidy (October 24): A small field of cotton that had apparently been ravaged by *Colaspis* sp. was found about 8 miles south of Tucson on October 23. During the past two seasons injury that approached a commercial damaging point has been noted from *Colaspis* sp. in two areas in the Tucson farming district.

### COTTON APHIDS (*Aphis*)

South Carolina. F. F. Bandy and J. F. Bainwater (September 30): *Aphis gossypii* Glov. has been present throughout the season but a severe infestation did not develop. (October 10): A few aphids are still found on the young tender growth of cotton at Florence.

Georgia. P. M. Gilmer (October 17): In southern Georgia cotton aphids are present in small numbers in a few fields.

Mississippi. E. W. Dunnan (October 17): Cotton aphids never developed to a noticeable extent in any fields in the vicinity of Stoneville, not a single complaint having been received.

Arizona. T. P. Cassidy (September 30): Cotton aphid infestation increased rapidly during the past week throughout the Tucson and Salt River Valley farming areas.

### COTTON FLEA HOPPER (*Psallus striatus* Reut.)

South Carolina. F. F. Bandy (October 10): The cotton flea hopper has decreased in numbers and very few are now found in cotton at Florence.

Georgia. P. M. Gilmer (October 10): There are a few flea hoppers present in cotton in southern Georgia.

Mississippi. E. W. Dunnan (October 17): At Stoneville no flea hoppers have been noted in cotton.

A. S. Young (October 3): In Oktibbeha County cotton plants have made good growth during August and September. Flea hoppers have been fairly abundant and the prospects are for a much larger crop of flea hoppers next spring than during the past 3 years.

Texas. K. P. Ewing (October 24): The principal flea hopper activity noted this week was the catching of a few hoppers on the flight screens in Calhoun County, which shows that there is still some activity in the fields.

Mexico. C. S. Rude (October 20): No flea hoppers were observed at Tlahualilo.

### COMMON RED SPIDER (*Tetranychus telarius* L.)

South Carolina. F. F. Bandy (July): Local sporadic infestations of red spider occurred in Florence, Darlington, and Marlboro Counties. In two of these counties (Florence and Marlboro) the infestation was traced from pokeweed and curly dock, respectively.



# FOREST AND SHADE-TREE INSECTS

## BUCK MOTH (*Hemileuca main Dryar*)

Wisconsin. E. L. Chambers (October 23): Serious defoliation to oak, maple, and birch occurred in several northern counties late in August and moths appeared in large numbers during the latter part of September.

## HERLOCK SPANWORM (*Eilepia fuscicornis* Guen.)

Maine. H. B. Peirson (October): Larvae of herlock looper found on fir and spruce this summer on Mount Desert Island. A heavy flight was on in September. This insect seems to be rapidly increasing.

## ALDER

### A SAWFLY (*Herichthys americana* Prov.)

Connecticut. E. A. Bach (September 4): I collected adults of this sawfly on this date in and about an alder swamp near Middletown. The alders had been defoliated earlier in the season and were still bare at the time the adults were found emerging from the soil in large numbers. Cast larval skins were found attached to leaf petioles and twigs.

## BEECH

### A LEAF TIER (*Psilocorsis fasciella* Cham.)

Maryland. J. A. Hyslop (October 11): This lepidid ties two leaves together and between them feeds by eating off the epidermis bleaching the leaves. It has been working all summer and now has damaged from 25 to 50 percent of the leaves on every tree in my woodlot of about 50 acres at Annapolis.

### WOOLLY BEECH APID (*Phylloxera* sp.)

Connecticut. E. P. Felt (October 22): The beech leaf aphid has been somewhat abundant and injurious to beech trees at Middletown.

### BEECH SCALE (*Cryptococcus* sp.)

Maine. H. B. Peirson (October): A new small, but very heavy, infestation of felted beech scale was found on beech on Mount Desert Island on September

## ELM

### SMALLER EUROPEAN ELM BARK BEETLE (*Scolytus multistriatus* Marsh.)

West Virginia. M. W. Blackman (October): *S. multistriatus* was recently found in Parkersburg. By the end of September this pest was found over an area approximately 100 miles in diameter involving parts of both West Virginia and Ohio. It had not previously been known from either of these States.

ELM LEAF BEETLE (Galerucella xanthodulcis Schr.)

Washington. M. H. Hatch (September 28): A single specimen of elm leaf beetle was taken on this date at Seattle, in King County.

HEMLOCK

HEMLOCK BORER (Melanophila fulvotincta Harr.)

Pennsylvania. E. P. Felt (October 22): The spotted hemlock borer was abundant under the bark of hemlock trees in the Philadelphia district, presumably limiting its attack to weakened trees.

MAPLE

MAPLE BORER (Symphedon aceris Clem.)

Ohio. E. W. Mendenhall (October 15): The maple borer is found on soft maple in street plantings in Baltimore.

MAPLE LEAF CUTTER (Paraclemensia acrifoliella Fitch)

Massachusetts. E. P. Felt (October 22): The maple leaf cutter is locally abundant in the Pittsfield district.

PINE

ABBOT'S SAWFLY (Neodiprion abbotii Loach)

Ohio. T. H. Parks (October 24): Larvae of Abbot's pine sawfly were received from Hocking County, with the statement that they were injurious on young pines.

A WEEVIL (Hyllobius radicis Buchanan)

New York. E. P. Felt (October 22): A pine root weevil, H. radicis, the work of which has been noted earlier as H. pales West., is responsible for several reports of injury from Long Island.

WHITE PINE APHID (Cinara strobi Fitch)

New York. E. P. Felt (October 22): Full-grown adults and eggs are numerous on white pine at White Plains.

A PYRALID (Tetralopha robustella Zell.)

Ohio. T. H. Parks (October 24): Larvae were received from Hocking County with the statement that they were injurious on young red pines.

PINE NEEDLE SCALE (Chionaspis pinicoline Fitch)

Connecticut. M. P. Zappe (October 23): Scales very abundant in nurseries and

about 100,000 in various parts of Connecticut. Last year 12  
 specimens were taken, the first, 18.

As a result of the above, the following is recommended for the control of the above-mentioned situation:

1900-1901

— — — — —

Journal of Statistical Software

UNITED STATES DISTRICT COURT (District of Columbia)

[illegible]

A BLANKET (Furnish. with B. &amp; No. 1.)

El ridge. W. Saker (24 Mar 1): 3 eggs have been taken several times during the year on the leaves of the tanoil tree in central forest. (C. t. 12, 1934, 1935.)

INSECTS AFFECTING GREENHOUSE  
AND ORNAMENTAL PLANTS

DAIRY CREDIT CO. (Successors to the)

1914. J. S. Sawyer (Sawyer 23): At Little Mills, Cambodge County, a  
 severe loss, which has resulted in exceptional care, was seriously damaged  
 by wind-blown ice in the canyon, and portions being killed outright.  
 Fall, very and very good. The birds are now present.



A SCARABAEID (Ochrosidia villosa Burm.)

Connecticut. W. E. Britton (October 22): Two lots of grubs received from Greenwich, having caused moderate injury in lawns.

New York. E. P. Holt (October 22): Grubs of O. villosa were found in large numbers in an exceptionally fine lawn area at Rye.

ASIATIC SAWFLY (Anomala pictabilis Wtrk.)

Connecticut. W. E. Britton (October 22): Many untreated lawns lawned in New Haven and West Haven. Recently grubs were received from Norwalk.

GREEN JUNE BEETLE (Cotinis nitida L.)

Indiana. J. J. Davis (October 16): Green June beetle larvae reported damaging lawns in several southern Indiana localities, especially at Evansville, where, according to a report received August 25, the parasite Scelio subia Say was also abundant.

A MIDGE (Sciara inconstans Fitch)

Nebraska. M. H. Swenk (October 15): The tickl midge was reported infesting house plants in Lancaster County on October 1.

GARDEN FLEA HOPPER (Halticus citri Ashm.)

New Jersey. M. D. Leonard (October 15): On October 12 I observed at Ridgewood a rather large bed of operation, the leaves of which showed considerable effects of feeding punctures of the garden flea hopper. The insects were fairly numerous on the plants.

WHITE PEACH SCALE (Aspidiotus perniciosus Comstock)

District of Columbia. Mrs. F. McManamy (October 2): Specimens of scale insects on ornamental peach were collected in Washington, D. C. (Det. by H. Morrison.)

Virginia. G. T. French (October 9): The white peach scale is increasing materially in the vicinity of Richmond on privet hedges, and unquestionably is doing considerable damage.

South Carolina. G. W. Brown (September 18): Insect on mulberry foliage submitted from Rockwell, Spartanburg County, has been identified as A. pentagona.

Florida. G. B. Merrill (October 23): There appears to have been considerable hatching of white peach scale eggs during the last several weeks.

A SCALE INSECT (Pseudococcus azaleae Coll.)

Louisiana. E. Upton (September 9): A scale-infested azalea twig was taken in New Orleans. (Det. by H. Morrison.)

BOXWOOD

BOXWOOD LEAF MINER (Monarthropalpus buxi Labeoulx.)

Maryland. E. M. Cory (October 5): Boxwood leaf mine reported infecting Boxwood at Forest Glen.

CAMELLIA

TEA SCALE (Fiorinia theae Green)

North Carolina. M. Huttoff (September 16): Scale insect on japonica leaves at Wilmington. (Det. by H. Morrison.)

Mississippi. C. Lyle (October 24): This scale insect was attacking Camellia japonica at Lakesville and Ocean Springs the latter part of September.

CHINABERRY

A COREID (Jadara haematolema H. S.)

Oklahoma. F. A. Penton (October 22): We have received further reports of J. haematolema on Chinaberry trees.

CHRYSANTHEMUMS

THRIPS (Thysanoptera)

Maryland. E. M. Cory (October 3): Thrips reported on chrysanthemums at Baltimore.

Ohio. E. W. Mendenhall (October 16): Heliothrips haemorrhoidalis Bouche is abundant on chrysanthemums in greenhouses in Springfield.

CITRUS NEALYBUG (Pseudococcus citri Risso)

Ohio. E. W. Mendenhall (October 18): The nealy bug is abundant on chrysanthemums in a greenhouse in Piquette, Miami County.

DAHLIA

A CERMESYCID (Hippodamia lemniscata F.)

Louisiana. E. L. Dezier (September 30): Larvae were tunnelling the stalks of dahlia at New Orleans. A serious outbreak over the city during the last few weeks, killing hundreds of large plants.

POTATO LEAPHOPPER (Empoasca fabae Harr.)

Connecticut. W. Turner (October 17): Leafhoppers continued to make heavy attacks on Scholia until frost. Many varieties were so stunted that they did not blossom.

EUONYMUS

EUONYMUS SCALE (Chionaspis euonymi Comst.)

New Jersey. E. P. Felt (October 22): Euonymus scale was reported as injuriously abundant on Rachysandra at Orange.

Mississippi. Jack Milton (October 24): C. euonymi is very abundant at Magee.

GLADIOLUS

BLACK BLISTER BEETLE (Epicauta pennsylvanica Deg.)

Ohio. E. W. Mendenhall (October 1): Blister beetles were abundant on gladiolus and caused some damage to the flowers in gardens in Clark County.

HAWTHORN

QUINCE CURCULIO (Conotrachelus proutieri Walsh)

Georgia. O. I. Shapp (October 17): This insect was unusually abundant on haw trees at Fort Valley.

IVY

OLEANDER SCALE (Aspidiotus oleae Wall.)

Ohio. E. W. Mendenhall (October 1): Ivy or oleander scale abundant on ivy plants in greenhouse in Dayton.

LILIES

BULB MITE (Rhizoglyphus hyacinthi Biv.)

Nebraska. M. H. Swenk (October 15): From Clay County on September 30 came the report of a light infestation of lily bulbs.

MAGNOLIA

MAGNOLIA SCALE (Neolecanium cornuparvum Thro)

Connecticut. E. P. Felt (October 22): The magnolia scale was exceptionally abundant and quite injurious on a magnificent tree at Milltown.

ROSE

ROSE MIDGE (Dasynema rhododendri Coq.)

New York. E. P. Felt (October 22): The rose midge injured many tips of



to be present at Baskin, Long Island.

SPRINGFIELD CAME BORER (*Agrotis ruficollis* F.)

Ohio. J. W. H. (October 10): Estimated cane borer is abundant in the Ohio state in the spring of 1914.

SPRINGFIELD

SPRINGFIELD (*Agrotis ruficollis* L.)

New Jersey. H. B. Leonard (October 15): Strawflowers (*Helianthus* sp.) were considerably infested with the same on October 12.

SPRINGFIELD

TWO-MARKED TREESHOPPER (*Eutettix bimaculatus* Say)

New York. R. L. (October 10): While the two marked tree hopper were found on the leaves of several blackhaws (*Thalictrum* sp.) in the park at Rochester. The same was found on the leaves of the same tree in the park at Rochester.

INSECTS ATTACKING MAN AND  
DOMESTIC ANIMALS

INSECTS

MOSQUITOES (Culicidae)

Georgia. J. T. Hall (September 30): Residents of the island near Savannah state that there were fewer mosquitoes (*Aedes* spp.) this summer than ever before. More of these pests were found, however, during September than in the 2 preceding months.

Florida. J. R. Watson (October 22): In the northern part of the State September was very dry, therefore mosquitoes are much less abundant than in most years.

Tennessee. G. M. Bentley (October 25): During September and October there has been considerable annoyance in the state of Tennessee in the eastern part of the State.

Missouri. L. Haseman (October 21): During the month several species of native mosquitoes have been abundant and annoying on warm evenings.

Kansas. H. R. Brown (October 24): Mosquitoes were present again about the first week in October, after an almost complete absence during the summer.

Utah. G. F. Knowlton (September 29): Mosquitoes have annoyed man and livestock in many parts of Utah.

Oregon. A. E. Stone (September 30): The population of A. aldrichi Dyar and Knab and A. yakus Mead. in the lower Columbia River Valley fell off rapidly beginning July 17, when high temperature and low humidity became consistent. A most unusual number of A. aldrichi were, however, observed in a favorite breeding area near Portland on September 23. Seventy-one females were collected in a 10-minute sample. This number compares favorably with similar samples taken at the height of the breeding season. The specimens taken were killed viciously. Rarely larvae observed more than an occasional individual after September 1.

#### FLIES (Otencephalidae sp.)

United States. E. C. Cushing (October 25): Numerous letters from all parts of the country, asking for information on methods of controlling infestations of dog and cat flies (C. canis Curt. and C. felis Fouché) indicate that these pests have been more troublesome this season than for several years past in houses.

Indiana. J. J. Davis (October 16): Flies were frequently reported during August as very abundant and annoying in houses and farm buildings.

Nebraska. H. E. Swenk (October 15): On September 24 a Lancaster County correspondent reported the cat flea (C. felis) infesting a basement. From Richardson and Dodge Counties on October 7 and 8, respectively, complaints were received of the infestation of a basement and farm buildings by the dog flea (C. canis).

#### PUSS CATERPILLAR (Megalopa macularis S. & A.)

Alabama. J. M. Robinson (October 28): A flannel suit was received on October 9 from Frisco City, with a letter stating that a boy had been affected by the poison from the bristles. This proved to be M. macularis. A pupa came in today from Headland. It seriously affected the hand of a woman who attempted to brush the larva off.

Louisiana. T. E. Snyder (October 19): During the past few weeks the puss caterpillar has been attracting considerable interest in the vicinity of New Orleans. We have had four or five samples turned in to the office which were either feeding on rose hedges or choke cherry (cultivated). The caterpillars have been brought to the office, not on account of the fact that they were defoliating plants, but because they caused nettle rash. In an old last year's record I obtained quite a few adult flies this year. (Det. by D. G. Hall as Wingless sp.)

#### BLACK WIDOW SPIDER (Latroctes mactans F.)

Alabama. J. M. Robinson (October 28): On September 25 a black widow spider was received in this office. It was reported by a doctor at Edeville as having bitten a person, resulting in serious injury.

Washington. R. S. Lohman (October 26): A heavy infestation of black widow spiders was investigated in an outdoor dirt cellar at College Place. The owner also reported seeing the spiders in the house and in large places around the doors.

#### SAND FLIES (Gulicoides sp.)

Florida. J. B. Hall (September 30): During July all reports from the lower east coast of Florida stated that sand flies were worse than the oldest residents could remember. More correspondence in regard to sand fly annoyance and requests for aid were received that month than ever before.

Georgia. J. B. Hall (September 30): During September, especially the third week of the month, G. conithorax Hoffm. became annoying from the grass marshes near Savannah and caused considerable annoyance for a few nights when the weather was cool.

#### CATTLE

#### SCREWWOORM (Coellicomyia americana C. & P.)

United States. W. E. Dove (October 26): During the past month sporadic reports, comparable to cases occurring in October 1935, were received from different counties. The low atmospheric temperatures caused farmers to castrate and earmark animals just before turning them into bean and peanut fields for fattening. When such injuries were not properly treated with a repellent they became favorable sites for screwworm infestations. For the period September 25 to October 23 the following reports of screwworms and related cases were received: Alabama, none; Arizona, 352; California, 158; Florida, 5,506; Georgia, 805; Louisiana, 5 cases in stockyards; Mississippi, 1 human case; New Mexico, 4,185; Oklahoma, 166; South Carolina, 10; and Texas (57 to approximately 75 counties), 15,709.

#### HORN FLY (Haematobia irritans L.)

Missouri. L. Hasegan (October 21): Notwithstanding the cool weather, the horn fly has continued to be rather abundant throughout central Missouri and extremely annoying to livestock on warm days.

Texas. H. D. Parish (October 19): Horn flies are very numerous around Menard and cause many cases of screwworms around the horns of bucks, written sheep, and horned ewes.

#### STABLEFLY (Stomoxys calcitrans L.)

South Carolina. F. Sherman and associates (October 20): Stable flies severe near the coast late in the summer.

Missouri. L. Hasegan (October 21): Notwithstanding the cool weather, the stable fly has continued to be rather abundant throughout central Missouri and extremely annoying to livestock on warm days.



## HORSE

### BOTFLIES (Gastrophilus sp.)

Texas. D. G. Parnon (October 5): Horse bots have been notably scarce this year. The first eggs or first observations were noted about September 17. During the next few days about one-half dozen adult flies were observed and a few eggs were deposited.

O. G. Bobcock (October 15): Stomach botflies (G. intestinalis) have been depositing eggs at Menard for some time and are still doing so. Eggs on horses are fairly common.

Utah. G. F. Knowlton (September 29): Botflies have annoyed livestock in Garfield, Morgan, Juab, Millard, Wasatch, Rich, Tooele, and Salt Lake Counties.

## HOUSEHOLD AND STORED-PRODUCTS INSECTS

### GRANARY WEEVIL (Sitonaillus granaria L.)

New York. E. A. Back (October): S. granaria was received late in September from Jamaica.

New Jersey. E. A. Back (October): Specimens were received from Jersey City the latter part of September.

Pennsylvania. E. A. Back (September 27): On this date specimens were forwarded from Sinking Springs, where thousands of them were reported to be swarming throughout a house. It was claimed that they crawled to the house from a flour and grist mill located on adjoining property.

### RICE WEEVIL (Sitonaillus oryzae L.)

Mississippi. J. E. Lee (October 24): The corn at the South Mississippi Experiment Station at Poplarville had been damaged 20 percent by weevils before harvest.

### VARIED CARPET BEETLE (Anthrenus verbasci L.)

General. E. A. Back (October 1): Specimens of carpet beetle in larval form have been received from the following places: Woodlawn, N. Y.; Pittsburgh, Pa.; Baltimore and Braddock Heights, Md.; Detroit, Mich.; and Seattle, Wash. In Seattle the infestation was so heavy that the entire house was fumigated. Numerous living larvae were found after the fumigation.

### CARPET BEETLE (Anthrenus sarcinularius L.)

Indiana. G. E. Gould (October 29): Reports have been received from various parts of the State concerning occurrence of the buffalo carpet beetle

larvae and damage by it.

HIDE BEETLE (Dermaestus valinus F.)

Michigan. E. A. Back (September): Larvae and adults were received from a house in Detroit the second week of September. Specimens could not be traced to a source of food supply.

A. DERMESTID (Thylosinus contractus Mots.)

Illinois. E. A. Back (October): This dermestid was received September 2 from a home in Chicago where they were crawling over clean clothing and becoming trapped in dishes. The species was also received in the larval form late in September from an apartment house in Chicago where it was so troublesome that control measures were turned over to a firm of exterminators.

BLACK FUNGUS BEETLE (Alphitobius piceus Oliv.)

California. E. A. Back (October): The black fungus beetle, a common pest of farinaceous materials, was collected in September in southern California in a mausoleum, where the adults were found in large clusters along the cracks surrounding the stones sealing the individual vaults.

A. TENEBRIONID (Alobates pennsylvanica Des.)

New York. E. A. Back (September 18): Specimens were received on September 18 from a house in Orchard Park.

CIGARETTE BEETLE (Lasioderma serricorne F.)

District of Columbia. E. A. Back (October 8): The cigarette beetle was found in Washington emerging on October 8 from furniture containing 65 percent flax tow. Furniture was purchased new in September 1935. The beetle was found in October emerging in numbers in Washington, D. C., from upholstered furniture just unpacked from Istanbul, Turkey.

Nebraska. M. H. Swenk (October 15): A specimen of the cigarette beetle was sent in by a Douglas County correspondent on October 5, with the statement that it was proving troublesome in a house in that county.

CORN SAP BEETLE (Carpophilus dimidiatus F.)

Mississippi. C. Lyle (October 24): On September 24 the corn sap beetle was found at Houston in considerable numbers on cotton seed that had been cracked.

POWDER POST BEETLES (Lyctus spp.)

Florida. J. R. Watson (October 22): A great deal of damage was done to lawn furniture, mostly of cypress wood, by the powder post beetle.

Indiana. J. J. Davis (October 14): Powder post beetles have been destructive to timbers in many sections of the State.

A GRAY BEETLE (Chalcidius constrictus Gyll.)

Florida. Dade Co. S. A. Jones (October 27): C. constrictus was moderately common in a field of corn at Dade. (Det. by W. S. Fisher)

HOUSE CRICKET (Gryllus domesticus L.)

Virginia. A. A. Beck (October): On June 1 a cricket was collected from Dade with the statement that it had been before him.

Ohio. E. A. Smith (October): On October 3, G. domesticus was received from Dade with the statement that the insects are taken from a house located near a silk house.

Utah. G. F. Knowlton (September 29): Crickets were common in houses at Hatch, N.M.

NORTHERN HOLE CRICKET (Scaphiotus longicauda Ferty)

Mass. A. A. Beck (October 15): Specimens of S. longicauda were received on October 15 from a silk-stocking room of a manufacturing firm in Dade.

INDIAN-HEAD CRICKET (Ploceus interstitialis Fm.)

Florida. F. A. Jones (October 27): P. interstitialis is still common in storage at Dade.

SILVERFISH (Leuciscus argenteus L.)

Massachusetts. G. M. Bentley (October 21): The silverfish is prevalent in many streams in the State. It is common to be taken in traps, as well as by net.





## REPORT ON STATUS OF THE EUROPEAN CORN BORER in 1936

By A. M. Vance, Associate Entomologist  
Division of Cereal and Forage Insect Investigations  
Bureau of Entomology and Plant Quarantine  
U. S. Department of Agriculture

The relative abundance of the European corn borer in the fall of 1936 and its status this year, in comparison with 1935, were determined from a survey conducted from August 10 to October 2 by the Bureau of Entomology and Plant Quarantine over a large part of the territory infested by the insect. The activity was directed from the laboratory for European corn borer research at Toledo, Ohio, W. A. Baker in charge. Nineteen men, operating singly, were engaged in the field work. The survey involved approximately 39,100 miles of travel and the examination of 2,118 cornfields, taken at random on a county or county-group basis, within a total of 156 counties in Michigan, Indiana, Ohio, Pennsylvania, New York, Vermont, Maine, New Hampshire, Massachusetts, Rhode Island, Connecticut, New Jersey, Delaware, Maryland, and Virginia.

Active cooperation in the survey was given by the Conservation Department of Indiana and the State Department of Agriculture in Maine, the former surveying three county groups (120 fields) in Indiana, and the latter surveying seven counties (180 fields) in Maine.

Thoroughly tested field methods, known to supply data adequate for comparisons between counties and county groups for 1 or more years, were employed. Generally, the counties situated in the older infested portion of the area were considered separately, and in each a total of 20 random fields were surveyed.

In the more lightly infested sections, the counties were combined in groups of from two to five, and in each group a total of 30 or 40 random fields were surveyed. The percentage of plant infestation was determined by a count of 100 plants in each field, and the average number of borers per infested plant was found by a dissection of 10 infested plants in each field of a county unit and of 5 infested plants in each field of a county group.

The accompanying tables, maps, and chart show the status of the European corn borer in 1936, in comparison with its abundance in recent years, and the following discussion summarizes the situation in 1936.

# LAKE STATES (MICHIGAN, INDIANA, OHIO, PENNSYLVANIA, AND WESTERN NEW YORK)

Definite decreases in infestation in 1936, as compared with 1935, occurred in eastern Indiana, where the average number of borers per 100 plants decreased from 9.3 in 1935 to 3.2 in 1936; in the lower two-thirds of the region surveyed in the western half of Ohio, where the average number of borers per 100 plants diminished from 22.5 in 1935 to 3.5 in 1936; and in the "thick" section of Michigan, where the average number of borers per 100 plants decreased from 142.7 in 1935 to 95.3 in 1936. As a result of such decreases in population, the status of the corn borer in the above portions of the infested territory in 1936 was little changed from that prevalent in the drought year of 1934, with a practical elimination of the gain in 1935. These decreases in numbers of the borer in 1936 are attributed to drought, particularly to the effect of a lack of rainfall in the first half of July, supplemented by abnormally high temperatures prevalent during the second week of that period.

Borer populations in the northwestern corner of Ohio and the southeastern part of Michigan, west of Lake Erie, however, were at least as high in 1936 as in 1935, with significant increases appearing in 11 of the 23 counties surveyed and with tendencies to increase evident in 4 of the remaining counties. In general, there was a more favorable moisture distribution in these sections than in the areas that showed decreased infestation. This permitted multiplication of the borer despite an appreciable reduction of live farms early in the season, owing to a partial mortality of approximately 20 percent caused by excessive heat the second week of July. Nevertheless, the high temperatures detrimental to the pupae were probably responsible for the production of a limited second generation of the corn borer in this area, the progeny from which augmented, in some cases, the fall population figures. However, both in the surveyed part of Ohio, as a whole, and in southeastern Michigan, including the regions of decrease in both States previously mentioned, there was a significant increase in the average number of borers per 100 plants in 1936 over 1935. In Ohio, this average increase was from 34.8 borers per 100 plants in 1935 to 50.4 in 1936, and in Michigan, from 45.7 borers per 100 plants in 1935 to 57.8 in 1936.

Corn borer infestation in the Lake States in 1936 was most intense west and south of the western end of Lake Erie, and the highest populations, observed as in 1935, were in Lucas and Wood Counties, Ohio, with averages of 151.5 and 138.4 borers per 100 plants, respectively. Eighteen (or 45 percent) of the 40 fields surveyed in the two counties had populations ranging from 115 to 727 borers per 100 plants.

The borer was found to be present in noticeable numbers in central Indiana and in the southwestern corner of Michigan, over a region not surveyed in the past 3 years. It is probable that the drought prevalent in 1936 also operated in this territory to reduce infestation.

In parts of central Michigan not previously surveyed, the borer was found to be practically as abundant as in some of the older infested counties of the eastern section of the State. An average infestation of 68.5 borers



per 100 plants occurred in the Clinton-Gratiot-Saginaw-Shiawassee County group and an average of 13.6 borers per 100 plants in the Barry-Eaton-Ionia County group. Ten (or 25 percent) of the 40 fields surveyed in the former county group had populations of over 100 borers per 100 plants, including one field that averaged 356 borers per 100 plants.

Corn borer abundance in 1936 remained at the relatively low level of 1935 in counties bordering the Lake in western New York, where the weather was very dry in the first half of July 1936, and in Centre County, Pa. Only 1 field of 112 surveyed in western New York and 8 fields of 60 surveyed in central Pennsylvania in 1936 had populations of more than 100 borers per 100 plants.

EASTERN STATES (VERMONT, MAINE, NEW HAMPSHIRE, MASSACHUSETTS,  
CONNECTICUT, RHODE ISLAND, NEW YORK (ONEIDA COUNTY),  
NEW JERSEY, DELAWARE, MARYLAND, AND VIRGINIA)

Significant increases in corn borer abundance appeared in 1936 in southwestern Vermont, central Massachusetts, eastern Connecticut, Rhode Island west of Narragansett Bay, and Delaware County, N.Y. Numbers of the insect increased appreciably in the Connecticut River Valley of central Massachusetts, as shown in the survey of the Franklin-Hampton-Harperline-Worcester County group (in Massachusetts), in which the average population rose from 20.6 borers per 100 plants in 1935 to 31.9 in 1936. Nineteen of the 40 fields surveyed in this county group showed populations of over 100 borers per 100 plants, and averaged 433.6 borers per 100 plants. In Moreau County, N. J., where the average number of borers per 100 plants increased from 47.4 in 1935 to 61.7 in 1936, 4 of the 20 fields surveyed had populations of over 100 borers per 100 plants, including a maximum of 353 borers per 100 plants in 1 field. The increases shown in the Eastern States were as follows: In the area including Addison-Bennington-Rutland Counties, Vt., from an average of 27.4 to 32.2 borers per 100 plants; in New London-Tolland-Windham Counties, Conn., from an average of 23.3 to 104.4 borers per 100 plants; and in Kent-Providence-Washington Counties, R. I., from an average of 71.5 to 154.2 borers per 100 plants.

With the exceptions of Essex and Bristol Counties, Mass., where populations of the borer remained practically unchanged, there was a lower infestation during the current year in the previous group, along the Atlantic coast from York County, Maine, to and including Bristol-Newport Counties, R. I. In Middlesex County, Conn., in Suffolk County, on Long Island, and on the Eastern Shore of Maryland and Virginia, significant decreases also occurred in the abundance of the insect from 1935 to 1936. The causes for all of these reductions are not known, but it appears certain that, in the surveyed portions of Maryland and Virginia, abnormally dry weather in May and early in June, at the time of first-generation oviposition and larval establishment, was responsible for low survival of the borer.

Borer populations, in 1936, in southwestern Vermont, in Hartford and New Haven Counties, Conn., and in the Atlantic-Atlantic Ocean County group in New Jersey remained practically unchanged.

The greatest abundance of the pest, either in the Lake or Eastern States, continued to be in southern New England and on Long Island, N. Y. Some of the highest borer populations in 1936 occurred in New Haven and Hartford Counties, Conn., where in 14 (or 35 percent) of the 40 fields surveyed, the average number of borers per 100 plants exceeded 500, and in 7 (or 17.5 percent) of the fields there were over 1,000 borers per 100 plants. In the latter class the field populations ranged from 1,041 to 1,833 borers per 100 plants. Only a light infestation appeared in Rockingham-Stratford Counties in the southeastern corner of New Hampshire, and in the eight counties surveyed in Maine.

In 1935 the counties of Middlesex, N. J., and Sussex, Del., were surveyed for the first time. An average of 6.7 borers per 100 plants was determined for the former county, with half of the 20 surveyed fields showing infestation, and an average of 1.1 borers per 100 plants was found in the latter county, with the distribution confined to 3 of the 32 fields surveyed, which had populations of 30, 3, and 1, borers per 100 plants, respectively.

Table 1.--Abundance of the European corn borer in the fall of 1936 as compared with 1934 and 1935

County or county group	Average borers per 100 plants		
	1934	1935	1936
<u>Lake States</u>			
<u>Michigan</u>	Number	Number	Number
Lenawee-----	12.3	5.4	53.6
Macomb-----	20.2	45.9	43.2
Monroe-----	27.2	42.9	98.0
St. Clair-----	11.8	51.3	23.4
Washtenaw-----	2.7	12.5	47.4
Wayne-----	7.7	7.2	95.6
Genesee-Lapeer-Sandwich-Tuscola-----	15.1	140.7	55.3
Hillsdale-Ingham-Jackson-----	1.2	17.1	25.6
Lapeer-Livingston-Oakland-----	3.7	23.5	29.9
Allegan-Mount-Ottawa-----	-	-	0.2
Barry-Eaton-Ionia-----	-	-	13.2
Branch-Calhoun-Kalamazoo-St. Joseph-----	-	-	1.0
Berrien-Cass-VanBuren-----	-	-	0
Clinton-Gratiot-Saginaw-Shiawassee-----	-	-	68.5
Regional average (based on first 9 counties and county groups)	11.6	45.7	57.8

Table 1. (continued)

County or county group	Average 1974	Average 1975	Average 1976
<u>Ohio</u>	<u>Barber</u>	<u>Barber</u>	<u>Barber</u>
Defiance	8.1	4.8	11.0
Fulton	25.1	41.0	45.3
Hancock	35.4	33.0	31.1
Harrison	22.4	4.2	14.2
Lucas	18.7	121.5	101.1
Ottawa	20.3	24.0	34.0
Paulding	5.2	33.1	10.4
Putnam	1.1	12.1	52.1
Sandusky	7.5	4.0	107.1
Seneca	25.7	27.1	31.2
Williams	18.2	2.2	15.4
Wood	41.1	1.2	132.4
Allen-Ashtabula-Portage-Trimble	2.1	20.8	1.1
Champaign-Darke-Lorain-Mitchell-Schuyler	5.0	12.0	0.1
Clark-Fayette-Greene-Morgan	1.1	1.1	1.1
Montgomery	1.1	1.1	1.1
Crawford-Huron	1.1	13.7	2.3
Delaware-Hamilton-McClain-Tipton	7.1	1.1	1.1
Regional average	12.9	1.8	50.6
<u>Indiana</u>			
Adams-Blackford-Jay-Wells	1.1	2.1	1.1
Allen-De Kalb-St. Joseph	1.1	1.1	10.1
Darke-DeWitt-Martin-Morgan	1.1	1.1	1.1
Harrison-Martin-Morgan	1.1	1.1	1.1
Elkhart-Laporte-St. Joseph	1.1	1.1	1.1
Fayette-Rush-Sullivan	1.1	1.1	1.1
Fulton-Morgan-Morgan	1.1	1.1	1.1
Grant-Laporte-Morgan-Morgan	1.1	1.1	1.1
Hamilton-Morgan-Morgan	1.1	1.1	1.1
Regional average (first 4 groups)	1.1	1.1	3.2
<u>New York</u>			
Chautauque-Erie-Niagara	11.1	11.1	11.1
Jefferson-Cattaraugus	11.1	11.1	11.1
Monroe-Cattaraugus-Warren	11.1	11.1	11.1
Regional average	11.1	11.1	11.1



Table 1. (continued)

County or county group	Average barrels per 100 plants		
	1934	1935	1936
<u>Virginia</u>	<u>Number</u>	<u>Barrels</u>	<u>Per bar</u>
Orange	-	28.5	20.0
South-Western - Shenandoah-Union	-	-	-
<u>Eastern States</u>			
<u>Virginia</u>			
Addison-Piedmont-Richmond	-	27.4	22.6
Onitama-Crest Hill-Ford Station	-	11.2	7.7
Regional average	-	32.3	21.7
<u>Florida</u>			
Oxford	-	0.5	0
York	-	12.4	0
Andromeda	-	-	0
Camdenland	-	-	0
Franklin	-	-	0
Kennel	-	-	0
Lincoln	-	-	3.0
Seagraves	-	-	0.8
Regional average, based on first two counties	-	1.5	0
<u>Massachusetts</u>			
Bristol	167.2	84.1	56.7
Essex	103.8	210.5	180.2
Middlesex	185.4	305.0	191.8
Barnstable and Plymouth	158.5	289.8	50.1
Franklin and Hampshire-Torres-			
ter	40.1	20.5	216.9
Regional average	113.5	174.2	131.9
<u>Rhode Island</u>			
Bristol-Portsmouth	172.3	150.1	63.1
Kent-Providences-Washington	61.7	71.5	154.2
Regional average	117.0	110.8	108.7

Table 1. (continued)

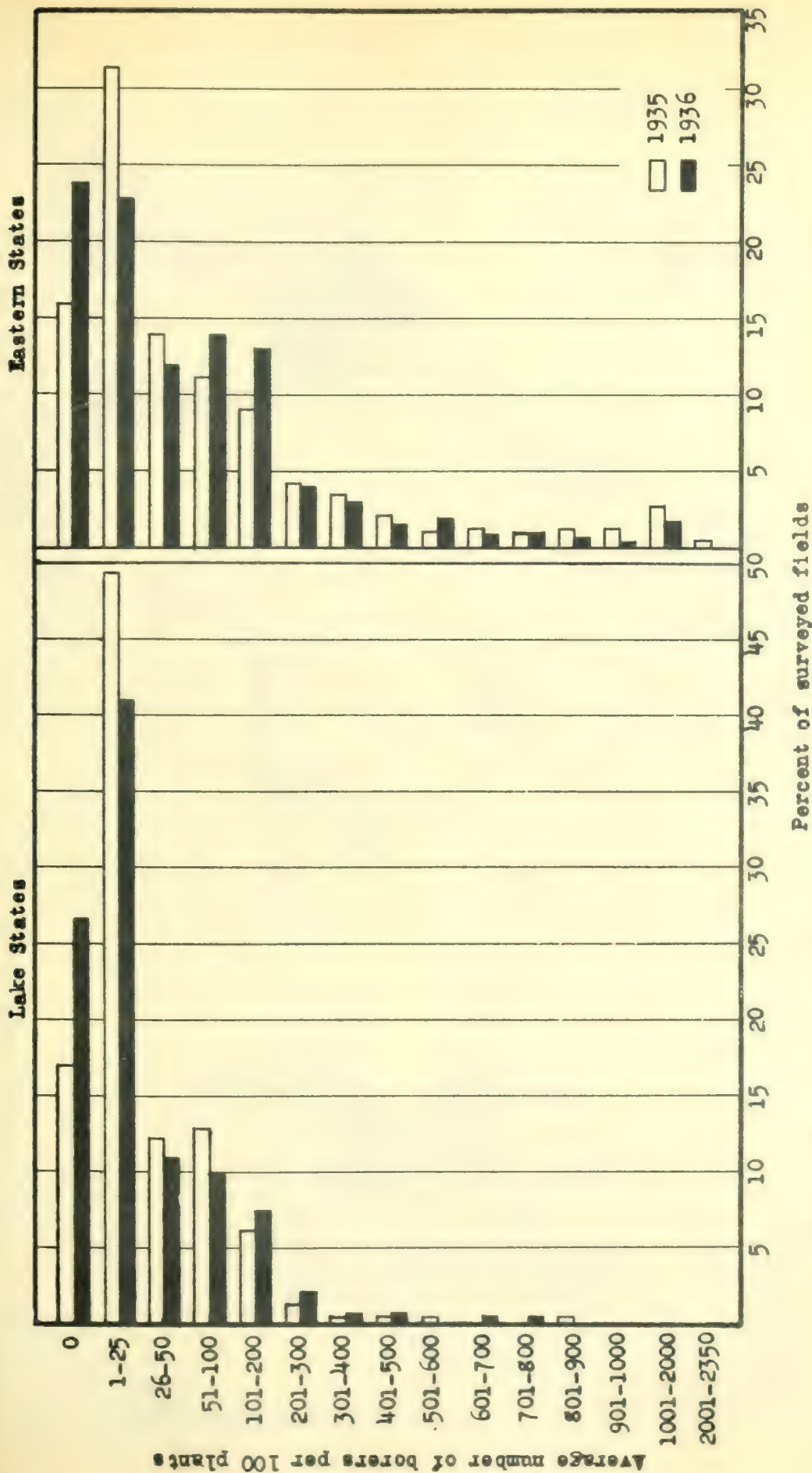
County or county group	Number of reports		
	1955	1956	1957
<u>Connecticut</u>			
Hartford	4.3	7.1	3.5
Middlesex	31.2	47.1	37.7
New Haven	2.5	1.1	2.7
New London-Old Saybrook-Victor	-	1.1	1.1
Regional average (based on first owner and present group)	27.5	36.5	26.9
<u>Delaware</u>			
Rockingham-Sussex	2.7	2.7	1.4
<u>Florida</u>			
Suffolk	279.	301.	301.
<u>Georgia</u>			
Monroe	20.1	13.1	15.7
Atlantic-Oakland	2.1	2.1	2.1
Middlesex	-	-	1.7
Regional average (based on first owner and present group)	11.	12.4	11.6
<u>Idaho</u>			
Wisconsin-Macomb	-	1.1	0
<u>Illinois</u>			
Adams-DeKalb	-	1.1	5.1
<u>Indiana</u>			
Sussex	-	-	1.1

Table 2.--Summary of European corn borer abundance by States and areas, 1934-1935

Area or State	Counties or county groups	Average larvae per 100 plants*		
		1934	1935	1935
<u>First States</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Number</u>
Michigan.....	9	11.6	43.7	47.8
Ohio.....	17	12.9	37.8	43.6
Indiana.....	4	6.7	3.3	3.4
New England.....	3	40.1	25.5	16.1
Pennsylvania.....	1	-	22.5	20.6
Areal average (based on 31 counties in first 4 States)---	-	17.6	34.9	43.8
<u>Eastern States</u>				
Massachusetts.....	5	114.5	174.2	131.9
Rhode Island.....	2	117.1	110.2	108.7
Connecticut.....	1	690.2	513.6	349.9
New Hampshire.....	1	2.7	12.1	10.4
New Jersey.....	2	11.1	38.4	51.6
New York (S. Dutch Co.)	1	272.0	506.0	325.9
Vermont.....	2	-	32.3	24.7
Maine.....	2	-	6.5	0
Delaware.....	4	-	-	3.1
Maryland.....	1	-	1.4	0
Virginia.....	1	-	16.1	5.1
Areal average (based on 10 counties in first 6 States)---	---	141.7	245.9	143.4

\* All averages based only on comparable counties or county groups.





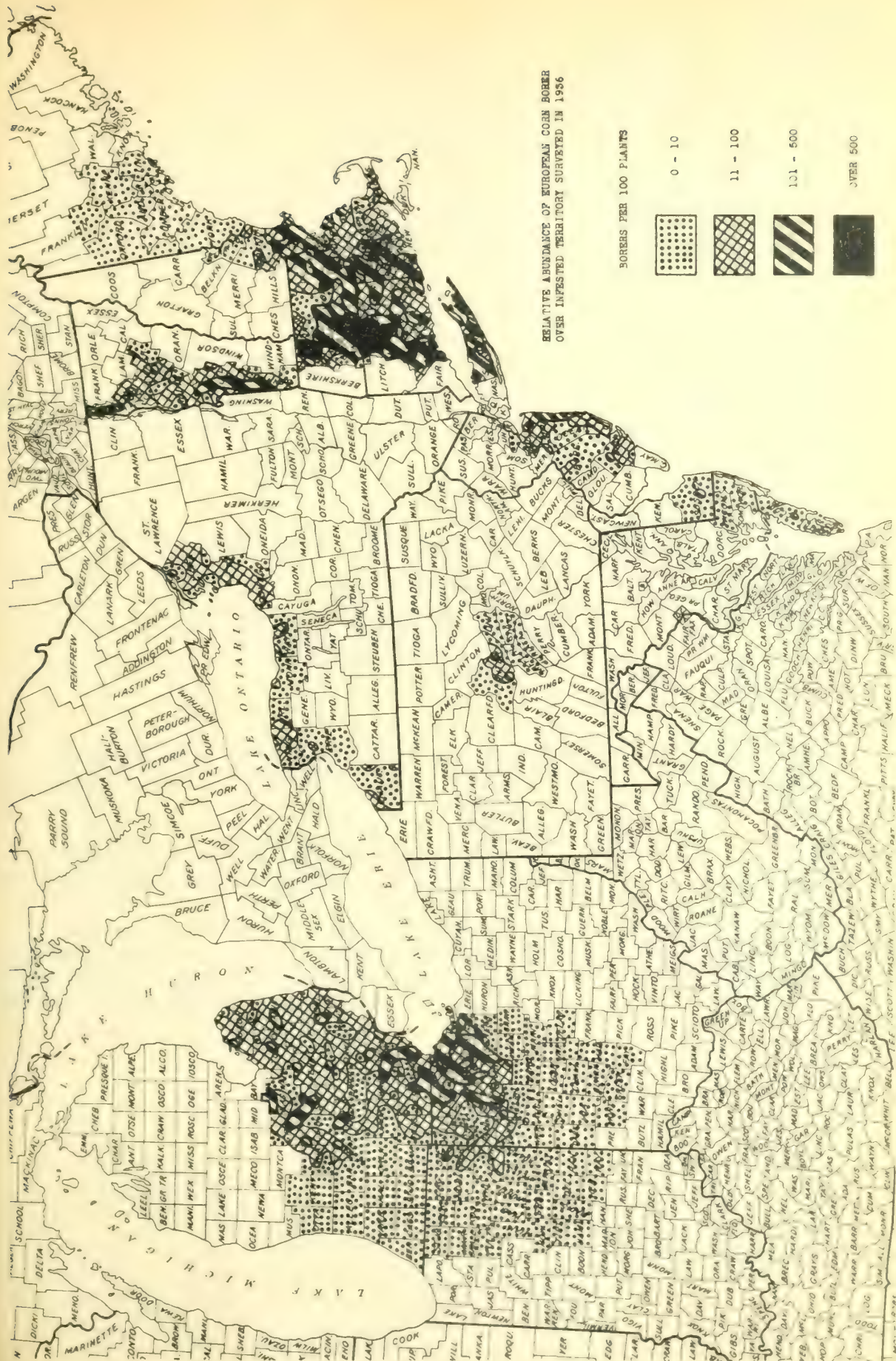
Grouping of cornfields surveyed in 1935 and 1936, in comparable counties, according to their borer populations. The percentages for the Lake States are based on 830 fields, and those for the Eastern States, on 550 fields, surveyed in each of the two years.















I N S E C T P E S T S U R V E Y B U L L E T I N

---

Vol. 16

Supplement to No. 9

December 15, 1936

---

I N S E C T N O T E S F R O M C O S T A R I C A I N 1 9 3 5

C. H. Ballou  
Chief of Entomological Section  
National Agricultural School  
San Pedro de Montes de Oca

This paper is supplemental to the Insect Notes from Costa Rica in 1934, published as a Supplement to No. 4, Insect Pest Survey Bulletin, Vol. 15, 1935.

The list does not represent the complete collection for the year, but only those notes that give additional data to the previous year.

The same arrangement has been followed as in the previous list. It is not deemed necessary to reissue the map of Costa Rica, as it may be consulted in the original paper. The abbreviations for the localities given in the previous list apply in this one.

COLEOPTERA

Insect and locality	Collected on	Date and notes
ANTHICIDAE Anthicus asphaltinus Champ. Paso Ancho	Annona muricata Brassica pekinensis Citrus aurantifolia Citrus nobilis Citrus sinensis Cornutia cymosa	Dahlia rosea Hibiscus rosa-sinensis Impatiens balsamina Phytolacca octandra Psidium guajava Vitis spp.
Motax eximius Champ. Guadalupe San Pedro	Cinnamomum camphora Coffea arabica Epidendrum sp. Eugenia uniflora	Malus sylvestris Persea americana Tabebuia pentaphylla
BRENTHIDAE Brentus mexicanus Boh. San Jose San Pedro	Acnistus arborescens Annona cherimola Coreopsis lanceolata Dombeya wallichii	Panicum barbinodes Persea americana Poinsettia pulcherrima
CANTHARIDAE Chauliognathus histrio (Dej.) San Pedro	Iris laevigata	April, in flowers June, at sap in wound August, October to December
CARABIDAE Euproctus subdeletus Bates San Pedro	Persea drymifolia	June
Lebia soror Chaud. Waldeck	Theobroma cacao	January April

Insect and locality	Collected on	Date and notes
CERAMBYCIDAE		
<i>Acanthoderes circumflexus</i> Dhw. Santa Rosa de Cartago	<i>Citrus sinensis</i>	September
<i>Callichroma holochlora</i> Bates Liberia	<i>Zea mays</i>	February
<i>Esthlogena porosa</i> Bates San Jose	<i>Ficus carica</i>	September, in dry rolled leaf
<i>Hippopsis lemniscata</i> (F.) San Pedro	<i>Chrysanthemum</i> sp.	June
<i>Ochresthes pollinosus</i> (Chevr.) San Pedro	<i>Acnistus arborescens</i>	December
<i>Pterichitaya pisciformis</i> Thomson San Pedro	<i>Chayota edulis</i>	October
<i>Ptychodes lecontei</i> Thomson Liberia	<i>Calathea insignis</i>	July
CURYSOMELIDAE		
<i>Allochroma sexmaculatum</i> Clark San Pedro	<i>Chayota edulis</i> <i>Zea mays</i>	June July
<i>Altica amethystina</i> Oliv. San Pedro	<i>Phaseolus vulgaris</i>	December
<i>Asphaera nobilitata</i> (F.) Waldeck	<i>Panicum maximum</i>	July
<i>Calligrapha elegantula</i> Jacoby El Pisote		September



Insect and locality	C o l l e c t e d o n	Date and notes
Cerotoma rogersi Jacoby Juan Vinas Pejivalle San Pedro Santiago	Amygdalus persica Panicum maximum Phaseolus lunatus Zea mays	Throughout year
Cerotoma salvini Baly Descamparados El Pisote San Pedro	Chayota edulis Cucurbita pepo Galinzoga hispida Impatiens balsamina	July to December
Chirida guttata (Oliv.) San Pedro Waldeck	Ipomoea sp. Phaseolus vulgaris Zea mays	July
Colaspis fulvotestacea Lef. Waldeck	Theobroma cacao	April
Colaspis prasina Lef. Sarchi	Chayota edulis Vernonia brachiata	January October, November
Colaspis sculpta Jacoby Waldeck	Theobroma cacao	April July
Colaspis submetallica Jacoby Waldeck	Theobroma cacao	April July
Coccophorus trizonatus Suffr. Guadalupe	Annona cherimola Byrsonima crassifolia	Citrus limonia Coffea arabica

Insect and locality	C o l l e c t e d o n	Date and notes
Cryptocephalus trizonatus-Cont'd San Jose San Juan	Croton gossypifolium Eugenia uniflora Ficus carica Gerbera jamesoni Lactuca sativa Ligustrum japonicum Malus sylvestris	Parkinsonia aculeata Prunus salicina Pyrus communis Rosa sp. Schinus molle Spondias mombin
Ctenochira cumulata (Boh.) Orosi San Pedro Waldeck	Chayota edulis Cernutia cymosa Gramineae (grass) Ipomoea sp.	March July October
Ctenochira vivida (Boh.) Waldeck	Ipomoea sp.	July
Diabrotica balteata Lec.	Ageratum conyzoides Asparagus officinalis Beaumontia grandiflora Beta vulgaris crassa Ceanothus odoratum	Brassica oleracea capitata Citrus aurantium Datura stramonium Daucus carota Phaseolus lunatus Vicia faba
Diabrotica fulvicornis Jacoby Cartago Juan Vinas	Acanthus arborescens Chayota edulis Codium variegatum Datura candida Erythrina glauca	Euphorbia sp. Hibiscus rosa-sinensis Phaseolus vulgaris Spondias mombin Zea mays
Diabrotica fulvesignata Balg Waldeck	Theobroma cacao	July

Insect and locality	C o l l e c t e d o n	Date and notes
Diabrotica nummularis Harold Juan Vinas San Jose San Juan San Pedro San Rafael	Allamanda cathartica Brassica pekinensis Beta vulgaris crassa Casimiroa edulis Cestrum nocturnum Chenopodium ambrosioides Citrus aurantium Citrus nobilis Coffea arabica Colocasia esculenta Conostegia lanceolata Dahlia rosea Datura candida Datura stramonium Daucus carota Fortunella margarita Hemerocallis sp. Lactuca sativa	July Important injury to dahlia, allamanda, and pe-tsai. <u>Zelus ruficeps</u> Stal eating this beetle on July 11.
Diabrotica porracea Harold Barba El Pisote San Jose San Isidro San Rafael	Amygdalus persica Dahlia rosea Gladiolus sp. Ipomoea sp. Pennisetum clandestinum  Chayota edulis	Important injury to snap beans
Diabrotica theimei Baly San Pedro	Lippia berlandieri Lycopersicum esculentum Myosotis sylvatica Fanicum barbinode Phaseolus lunatus Poinsettia pulcherrima Prunus salicina Psidium molle Pyrus communis Roystonea regia Solanum torvum Solanum wendlandi Stereulia diversifolia Trichilia havanensis Tropaeolum majus Verbesina turbacensis	October
Diabrotica viridula (F.) San Pedro	Pennisetum purpureum Persea americana Phaseolus vulgaris Tripsacum latifolia Zantedeschia aethiopica  Impatiens balsamina Vicia faba	January



Insect and locality	C o l l e c t e d o n	Date and notes
<i>Diabrotica vittata</i> (F.) Tres Rios	<i>Allium cepa</i> <i>Brassica oleracea capitata</i>	<i>Brassica pekinensis</i> <i>Daucus carota</i> <i>Persea americana</i>
<i>Disonychia trifasciata</i> Clark Paso Ancho Waldeck	<i>Musa sapientum</i> <i>Spondias mombin</i>	July August
<i>Epitrix fuscata</i> (Duv.) San Pedro San Rafael	<i>Acnistatus arborescens</i> <i>Cleome spinosa</i> <i>Datura stramonium</i> <i>Graminea? (grass)</i>	<i>Ipomoea batatas</i> <i>Ipomoea tiliacea</i> <i>Phaseolus vulgaris</i>
<i>Galeruca encaustica</i> Germ.	<i>Chayota edulis</i> <i>Erythrina rubrinervia</i> <i>Hedychium coronarium</i>	<i>Vernonia brachiata</i> <i>Zea mays</i>
<i>Homonophoeta cyanipennis</i> octomaculata (Grosch) La Inua Pejivalle San Antonio San Jose	<i>Ananas sativus</i> <i>Annona squamosa</i> <i>Asclepias curassavica</i> <i>Brassica japonica</i> <i>Citrus limonia</i> <i>Codiaeum variegatum</i> <i>Crotalaria spectabilis</i> <i>Datura candida</i> <i>Datura suaveolens</i>	January <i>Ficus carica</i> <i>Lycopersicon esculentum</i> <i>Mangifera indica</i> <i>Oryza sativa</i> <i>Panicum bartinode</i> <i>Poinsettia pulcherrima</i> <i>Punica granatum</i> <i>Rhedia edulis</i>
<i>Malacorhinus decerpunctatus</i> Jacoby Waldeck	<i>Theobroma cacao</i>	July
<i>Metritona angularis</i> (Champ.) Waldeck	<i>Ipomoea</i> sp.	July

Insect and locality	C o l l e c t e d o n	Date and notes
Metriona emarginata (Bon.) Guadalupe	Chayota edulis Coffea arabica	June September
Metriona judaica (F.) Waldeck	Coix lacryma-jobi	July
Metriona propinqua (Dej.) Waldeck	Coix lacryma-jobi	July
Metriona puella (Boh.) Waldeck	Elaeis guineensis Ipomoea sp.	July
Metriona zona (F.) Waldeck	Ipomoea sp.	July
Nodonota irazuensis (Jacoby) Barba Paraiso San Jose	<p>Albizia lophantha Alnus acuminata Amygdalus davidiana Ancistus arborescens Annona squamosa Artemisia absinthium Asparagus officinalis Averrhoa carambola Bauhinia monandra Byrsonima crassifolia Canna indica Capsicum annum Cassia sophora Cedrela montana mexi- cana Ceiba pentandra Chrysanthemum maximum Caryosphyllum cainito Citharexylum candatum</p>	<p>Destroying buds of zinnia and leaves of heliotrope</p> <p>Damaged tip of <u>Prunus</u> <u>davidiana</u> and <u>P.</u> <u>salicina</u></p> <p>Destroyed flowers of African daisy</p>
	<p>Clerodendron fragrans Cobaea scandens Colocasia esculenta Congee velutina Crotalaria spectabil- is Cucurbita ficifolia Datura candida Daucus carota Dombeya wallichii Geranium japoni Gomphrena globosa Grevillea robusta Hamelia erecta Heliotropium peruvi- anum Hibiscus abelmoschus Holcus sorghum Indigofera suffruc-</p>	

Insect and locality	Collected	Notes
Nodonota irazuensis - Cont'd.	<p>Inga laurina</p> <p>Lagerstroemia speciosa</p> <p>Lantana camara</p> <p>Eucura mammosa</p> <p>Lupinus sp.</p> <p>Melaleuca leucadendron</p> <p>Nicotiana tabacum</p> <p>Passiflora quadrangulata</p> <p>Pennisetum clandestinum</p> <p>Persea pittieri</p> <p>Phaeolus lanatus</p> <p>Plantago major</p> <p>Poinsettia pulcherrima</p>	<p>Polygonum acre</p> <p>Prunus salicina</p> <p>Psidium molle</p> <p>Punica granatum</p> <p>Rheeda edulis</p> <p>Rosmarinus officinalis</p> <p>Solanum nigrum</p> <p>Tabebuia guayacan</p> <p>Tagetes patula</p> <p>Taraxacum officinale</p> <p>Thespesia populnea</p> <p>Trema micrantha</p> <p>Triumfetta josephia</p> <p>Zinnia elegans</p>
Nodonota lateralis (Jacoby)	<p>Acrisus arborens</p> <p>Annona squamosa</p> <p>Asparagus officinalis</p> <p>Canarium odoratum</p> <p>Citrus aurantifolia</p> <p>Cobaea scandens</p> <p>Codiaeum variegatum</p> <p>Congea velutina</p> <p>Coreopsis lanceolata</p> <p>Croton gossypifolium</p> <p>Dahlia rosea</p> <p>Daucus carota</p> <p>Dombeya wallichii</p> <p>Gliricidia maculata</p> <p>Vernonia brachiata</p>	<p>Lupinus sp.</p> <p>Malacra radiata L.</p> <p>Melipighia glabra</p> <p>Menisot esculenta</p> <p>Pelargonium zonale</p> <p>Pennisetum purpureum</p> <p>Persea americana</p> <p>Persea pittieri</p> <p>Poinsettia pulcherrima</p> <p>Schinus molle</p> <p>Solanum sp.</p> <p>Tagetes patula</p> <p>Verbena sp.</p>
Oedionychis reichiei Harold		
Juan Vinas		
Paso Ancho		
San Jose		
		Seriously damaging
		early and lupine flowers
		August



Insect and locality	C o l l e c t e d o n	Date and notes
Oedionychis tenuicincta Jacoby	Dombeya wallichii	August
Pachybrachys femoratus (Oliv.) Paraiso Paso Ancho	Arracacia xanthorrhiza Asparagus officinalis Cupressus benthami Hibiscus rosa-sinensis Lippia berlandieri	Psidium guajava Sterculia diversifolia Vitis tiliaefolia Zinnia elegans
CICERIDAE		
Enoclerus villicus (Gorh.) Paso Ancho San Pedro	Chayota edulis Jussiaea decurrens Zea mays	June July August, October
COCCINELLIDAE		
Epilachna abrupta Gorh. San Isidro de Coronado San Pedro	Cestrum macrophyllum Erythrina rutrinervia Solanum aculeatissimum	May July August
Epilachna borealis (F.)	Chayota edulis	June to August Serious injury
Epilachna varivestis Muls. San Jose San Pedro	Chayota edulis	August Serious injury September
Epilachna defecta Muls. San Jose	Annona cherimola Capsicum annuum Cestrum aurantiacum	Conostegia lanceolata Cucurbita pepo
Epilachna virgata Muls.	Duranta plumieri	Serious injury
Thalassa glauca (Muls.) San Pedro	Erythrina rubrinervia Persea americana	January April

Insect and locality	Collected on	Date and notes
ELATERIDAE <i>Monocrepidius aversus</i> Lec. San Pedro	Persea americana	May
EUPOMYCHIDAE <i>Bystus hemisphaericus</i> (Gerst.) Waldeck	Theobroma cacao	July
EROTYLIDAE <i>Coccimorphus dichrous</i> Lac. Fejivalle Waldeck	Elaeis guineensis Phaseolus vulgaris	February July
<i>Cypherotylus elevatus</i> (F.)	Chayota edulis Citrus sinensis	July August
<i>Haplips fuscus</i> Reitt. Waldeck	Theobroma cacao	July
<i>Homocotelus jansoni</i> Crotch San Pedro	Coffea arabica	November
LAMPYRIDAE <i>Aspidosoma aegrotum</i> Germ. San Pedro	Citrus sinensis Pyrus commanis	August December
<i>Aspidosoma laterale</i> (F.) Juan Vinas	Coffea arabica	August
MITIDULIDAE <i>Corotelus mexicanus</i> Murr. Paso Ancho San Pedro	Chrysanthemum maximum Coreopsis lanceolata Cucurbita pepo	August January March
	Rosa sp.	In flowers

Insect and locality	Collected on	Date and notes
<i>Coatelia stercoroides</i> Murr. San Pedro San Rafael	<i>Ageratum conyzoides</i> <i>Chrysanthemum</i> sp. <i>Citrus limonia</i>	January to March July, December, in flowers
SCARABAEIDAE		
<i>Carrion viridis</i> (Beauv.) Wallack	<i>Theobroma cacao</i>	April
<i>Cyclocephala mafaffa</i> Burm. San Pedro	<i>Caladium bicolor</i> <i>Xanthoroma heleborii-</i> <i>folium</i>	June Adults eat July flowers
<i>Gymnetis liturata</i> (Oliv.) Juan Vinas	<i>Inga paterno</i>	August
<i>Macroderus lineatus</i> Chev. San Jose	<i>Citrus nobilis</i> <i>Citrus sinensis</i>	Serious injury to flowers
<i>Macroderus suavis</i> Bates	<i>Chrysanthemum maximum</i> <i>Rosa</i> sp.	
<i>Macroderus sylphus</i> Bates	<i>Ageratum conyzoides</i> <i>Chrysanthemum maximum</i>	<i>Citrus sinensis</i>
<i>Pachystethus micans</i> (Burm.)	<i>Citrus limonia</i>	July
<i>Pachystethus nitidula</i> (Blanch.) El Pisote San Isidro de Coronado San Pedro San Rafael	<i>Chrysanthemum maximum</i> <i>Fragaria chilloensis</i> <i>Pennisetum purpureum</i> <i>Zantedeschia aethiopica</i>	December May October September
<i>Strigoderma rutelina</i> Bates San Pedro	<i>Beta vulgaris crassa</i> <i>Persea americana</i>	January
	<i>Rosa</i> sp.	



Insect and locality	Collection	Date and notes
STAPHYLINIDAE Philonthus femilis Erichs.	Chayote edulis	Phaseolus vulgaris
TENEBRIONIDAE Lobometopon guatemalensis (Champ.) Paso Ancho	Ageratum conyzoides Amygdalus davidiana  Annona cherimola Annona reticulata Asparagus officinalis Averrhoa carambola Boehmeria nivea Casimiroa edulis Crotalaria striata Cucurbita pepo Dianthus caryophyllus Dillenia indica Eriobotrya japonica Ficus carica	Ficus religiosa Gliricidia maculata Impatiens balsamina Lippia berlandieri Panicum barbinode Persea pittieri Populus sativus Saccharum officinarum Schinus molle Solanum tuberosum Triumfetta josephina Tropaeolum majus Zea mays
Scaevola pauciflora Champ.	Annona cherimola Asparagus officinalis Eamelia erecta Mangifera indica	Prunus salicina Pyrus communis Vicia faba
Strawberry peruviana Maclean Waiack	Theobroma cacao	April
PHYCNOPTERA Anopterus exilis Boh.	Phaseolus vulgaris	November
Attelabus coricollis Sharp Paso Ancho	Psidium guajava	December

Insect and locality	Collected on	Date and notes
<i>Atteleius corvinus</i> Gyll. Waldeck	<i>Spondias mombin</i>	August
<i>Ealis aerea</i> (Boa.) San Pedro	<i>Chrysanthemum</i> sp.	January
<i>Cleistolopeus similis</i> (Chevr.) San Rafael	<i>Boenmeria nivea</i> <i>Chrysophyllum cainito</i> <i>Erythrina rubrinervia</i>	February June July, August
<i>Conotrachelus fulvescens</i> Champ. San Pedro	<i>Canarium odoratum</i> <i>Persea americana</i>	January February, October
<i>Conotrachelus perseae</i> Barber San Pedro	<i>Persea americana</i>	February, August, October, December
<i>Conotrachelus signatus</i> Kirson. San Pedro	<i>Persea americana</i>	May
<i>Copturus perseae</i> Gunth. San Pedro	<i>Persea americana</i>	February March
<i>Euminius festinus</i> (F.)	<i>Citharexylum caudatum</i>	October
<i>Exophthalmus jekellianus</i> (Waite) Juan Vinas Santiago Siquirres Turrialba Waldeck	<i>Citrus limonia</i> <i>Citrus paradisi</i> <i>Citrus sinensis</i> <i>Coffea arabica</i> <i>Cupressus benthami</i> <i>Dahlia rosea</i>	July August
<i>Exophthalmus sculptus</i> Champ. Gundalupe Tres Rios	<i>Fragaria chiloensis</i> <i>Heliotropium</i> sp. <i>Hibiscus ros-sinensis</i> <i>Musa sapientum</i> <i>Spondias purpurea</i>	Seriously damages coffee foliage

Insect and locality	Collected on	Date and notes
<i>Exopthalma sulciatus</i> Chapm. Liberia	<i>Citrus sinensis</i> <i>Solanum</i> sp.	July
<i>Geraeus lentiginosus</i> (Boh.)	<i>Citrus medica</i> <i>Cyperus caracasensis</i> <i>Dahlia rosea</i> <i>Daucus carota</i> <i>Dianthus caryophyllus</i>	October to March
<i>Geraeus lineellus</i> (Lec.) San Pedro	<i>Impatiens balsamina</i>	October
<i>Geraeus senilis</i> (Gyll.) Paso Ancho San Pedro Santiago	<i>Zea mays</i>	June Serious injury July to corn August
<i>Hellinus trifasciatus</i> F. Sixaola	<i>Persea americana</i>	July Reared in seed Serious injury
<i>Metamasius sericeus</i> (Oliv.) San Lorenzo San Pedro	<i>Acroconia vinifera</i> <i>Musa textilis</i>	March September
<i>Pantomorus femoratus</i> Sharp. Atlixola	<i>Zea mays</i>	October
<i>Pyrrhidius divergens</i> (Germ.) San Pedro	<i>Lycopersicon esculentum</i>	June
<i>Rhinospizella albomarginata</i> Chev. San Jose San Pedro	<i>Panicum barbinode</i> <i>Saccharum officinarum</i>	July August October



Insect and locality	Collection	Date and notes
<i>Rhodobaenus stigmaticus</i> (Furness) Liberia	<i>Chayote edulis</i> <i>Saccharum officinarum</i>	July
<i>Rhodobaenus tridecimpunctatus</i> <i>gracilis</i> Champ. Rio Grande	Gramineae (grass)	February
<i>Steirarrhinus nebulosus</i> Champ.	<i>Chayote edulis</i> <i>Passiflora edulis</i> <i>Randia mitis</i> <i>Zinnia elegans</i>	May July, September

D I P T E R A

<i>Anastrepha serpentina</i> (Wied.)	<i>Lucuma mammosa</i>	<i>Chrysophyllum calinito</i>	August	Larvae destroy the fruit
<i>Canotoprosopella xanthoptera</i> Hendel San Pedro	<i>Phaseolus vulgaris</i>		October November	
<i>Carpolonchaca pendula</i> Bezzi Paraiso Paso Ancho San Pedro	<i>Manihot esculenta</i>		May August September December	Serious injury to tips by larvae
<i>Chrysops variegata</i> Deg. Pejivalle	Horses		February	
<i>Dermatobia hominis</i> (L.) Pejivalle San Pedro Sixcola	Man Cattle		January June	

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Dilophus melanarius</i> V. d. Walp. Paraiso San Jose San Pedro San Rafael	<i>Cosmiron edulis</i> <i>Carysantaema maximum</i> <i>Cupressus benthiana</i> <i>Mangifera indica</i> <i>Persea americana</i>	January February June October December
<i>Plectia atterrata</i> Bell Sanatorio Duran	<i>Solanum tuberosum</i>	September
<i>Phrynosoma brevicomis</i> Guer. San Rafael	<i>Asparagus officinalis</i> <i>Averrhoa carambola</i> <i>Cosmiron edulis</i> <i>Coccoloba equisetifolia</i> <i>Hibiscus rosa-sinensis</i>	January February August      <i>Ipomoea batatas</i> <i>Mangifera indica</i> <i>Prunus salicina</i> <i>Rhododendron</i> sp. <i>Rosa</i> sp. <i>Saccharum officinarum</i>
<i>Riccardia polyantha</i> (F.) San Pedro Waldeck	<i>Conium maculatum</i> <i>Carysantaema maximum</i> <i>Tabernaemontana big-noniiflora</i>	July September November December
<i>Riccardia telescopica</i> Gerst. Waldeck	<i>Theobroma cacao</i>	July
<i>Tetracera obscuriven- tris</i> Leew	<i>Croton gossypifolium</i> <i>Eugenia uniflora</i> <i>Lourea japonicum</i>	April August

# HOMOPTERA

Insect and locality	Collected on	Date and notes
<b>ALCANTARIDAE</b>		
<i>Alcantarix woglumi</i> Ashby San Jose Tres Rios	<i>Citrus sinensis</i> <i>Mangifera indica</i> <i>Persea americana</i>	Adults feed only on tender leaves of avocado.
<i>Alcantarix oculireformis</i> Quaint and Baser San Pedro	<i>Passiflora ligularis</i>	December
<i>Alcantarix howardi</i> (Quaint.) Santo Domingo de Heredia Tres Rios	<i>Citrus medica</i> <i>Citrus nobilis</i> <i>Fortunella japonica</i>	October November January
<b>APHIDAE</b>		
<i>Aphis nerii</i> Boyer San Pedro	<i>Asclepias curassavica</i> <i>Hibiscus rosa-sinensis</i>	January, March, May, September
<i>Cerataphis lataniae</i> (Boisd.) San Pedro	<i>Roystonea regia</i>	December
<i>Macrosiphum rosae</i> (L.) Paso Ancho San Pedro Sarconi	<i>Rosa</i> sp.	December, February May
<i>Rhopalosiphum pseudobrassicae</i> (Davis) Guadalupe	<i>Brassica oleracea</i> <i>capitata</i> <i>Brassica pekinensis</i>	February March
	<i>Raphanus sativus</i>	



Insect and Locality	Collected on	Date collected
<i>Texoptera virginitae</i> Boyer Tres Rios	Camellia japonica Citrus aurantifolia Citrus medica	Citrus paradisica Fortunella margarita
<b>CEROCEPIDAE</b>		
<i>Copisus siccifolius</i> (Walk.) San Antonio de Belen	<i>Bidens pilosa</i> <i>Citrus sinensis</i>	<i>Gliricidia acaciata</i> June
<i>Clasoptera funesta</i> Stal Florida Paso Ancho Waldeck	<i>Musa sapientum</i> <i>Tabernaemontana coronaria</i> <i>Vernonia brevifolia</i>	April July August
<i>Clasoptera obtusa</i> (Say) Santa Ana	<i>Guzmania ulmifolia</i>	April
<i>Epiernion championi</i> Fowl.	<i>Cestrum macrophyllum</i> <i>Ficus carica</i>	January September
<i>Tomaspis bicincta</i> (Say) San Pedro	<i>Caryota edulis</i> <i>Cacurbita pepo</i> <i>Paspalum notatum</i> Zen mays	July October November
<i>Tomaspis incana</i> (Gaer.) San Pedro	Zen mays	July
<i>Tomaspis postica</i> (Walk.) Juan Vinas Pedivalle San Pedro	<i>Chrysanthemum maximum</i> <i>Melastomae sylvestris</i> <i>Panicum barbinode</i> <i>Panicum maximum</i>	<i>Phaseolus vulgaris</i> <i>Tropaeolum majus</i> Zen mays June July August

Insect and locality	Collected on	Date and notes
<i>Eragrostis similis</i> (Wolk.) El Pisote	Gramineae (grass)	September
<b>CICADLLIDAE</b>		
<i>Aceratagallia sordida</i> Oman San Pedro	<i>Ipomoea batatas</i>	April
<i>Agallia ingens</i> Oman San Pedro	<i>Chayote edulis</i>	August
<i>Agallia lingula</i> Van D. Paso Ancho San Pedro	<i>Capriola dactylon</i> <i>Coreopsis lanceolata</i> <i>Dahlia rosea</i>	December, January, February, April, August
<i>Agallia modesta</i> O. & E.* Juan Vinas Paso Ancho San Pedro San Rafael Sarchi	<i>Acnistus arborescens</i> <i>Capriola dactylon</i> <i>Chenopodium ambrosioides</i> <i>Clerodendron fragrans</i> <i>Coreopsis lanceolata</i> <i>Dahlia rosea</i>	Throughout year
<i>Agallia novella tropicalis</i> Van D. Paraiso San Jose	<i>Acnistus arborescens</i> <i>Camellia japonica</i> <i>Chenopodium ambrosioides</i> <i>Grevillea robusta</i> <i>Hibiscus rosa-sinensis</i> <i>Ipomoea batatas</i> <i>Lippia berlandieri</i> <i>Lycopersicum esculentum</i>	Throughout year
	<i>Pelargonium graveolens</i> <i>Pelargonium zonale</i> <i>Terminalia catappa</i> <i>Trifolium fragiferum</i> <i>Vernonia brochiatata</i> <i>Vicia faba</i> <i>Vicia minor</i> <i>Viola odorata</i>	

\* This species was incorrectly listed as *Agallia modesta* O. & B. in the Insect Pest Survey Bulletin, supplement to Vol. 15, no. 4, p. 183, June 1935.

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Agallia repleta</i> Van D. Waldeck	<i>Theobroma cacao</i>	April
<i>Agellus bisinuatus</i> DeLong Sarchi	<i>Capriola dactylon</i>	January
<i>Aulacizes panamensis</i> Fowl. Juan Vinas	<i>Anacardium rhinocarpus</i> <i>Cornutia cymosa</i> <i>Croton gossypifolium</i>	October- December
<i>Cameocephala sagittifera</i> Uhl. La Caja Juan Vinas Paso Ancho San Rafael Santiago Sarchi	<i>Dahlia rosea</i> <i>Fragaria chilensis</i> <i>Viola tricolor</i>	May August
<i>Cicadella amita</i> Fowl. Waldeck	<i>Coix lacryma-jobi</i>	April July
<i>Cicadella areolata</i> Sign. Alojuela Paso Ancho Paraiso San Jose Santiago Tres Rios	<i>Acinetia arborescens</i> <i>Anacardium occidentale</i> <i>Agapanthus umbellatus</i> <i>Casimiroa edulis</i> <i>Cedrela montana mexi-</i> <i>cana</i> <i>Cestrum macrophyllum</i> <i>Citrus sinensis</i> <i>Cymbopogon citratus</i> <i>Dahlia rosea</i>	Throughout year
	<i>Ficus carica</i> <i>Fortunella japonica</i> <i>Grevillea robusta</i> <i>Mangifera indica</i> <i>Panicum barbinode</i> <i>Persea americana</i> <i>Phaseolus lunatus</i> <i>Poinsettia pulcher-</i> <i>rima</i> <i>Vernonia bracteata</i>	



Insect and locality	C o l l e c t e d o n	Date and notes
Cicadella coeruleovittata Sign. El Pisote Paso Ancho Waldeck	Ageratum conyzoides Beta vulgaris crassa Bidens pilosa Brassica japonica Brassica pekinensis Byrsonima crassifolia Caladium bicolor Coix lacryma-jobi Coleus blumei Colocasia esculenta Coreopsis lanceolata	Eugenia uniflora Hedychium coronarium Fragaria chiloensis Hibiscus rosa-sinensis Ipomoea batatas Ipomoea tiliaea Jacobinia coccinea Lactuca sativa Polygonum acre Raphanus sativus Solanum tuberosum
Cicadella costaricensis Dist. El Pisote	Vernonia brachiata	September
Cicadella lativittata Fowl. Santiago	Fragaria chiloensis	August
Cicadella lutea Sign.	Ficus religiosa Grevillea robusta	Psidium guajava Terminalia catappa
Cicadella miniaticeps Fowl. Alajuela Juan Vinas La Caja Paso Ancho Pejivalle San Rafael Waldeck	Acanthus arborescens Ageratum conyzoides Allamanda cathartica Baccharis nervosa Calyptanthus costaricensis Canna indica Capriola dactylon Capsicum annuum Chayote edulis Chenopodium ambrosioides	Coffea arabica Coix lacryma-jobi Crotalaria spectabilis Cynodenum sp. Datura candida Daucus carota Dillenia indica Dovyalis hebecarpa Eugenia malaccensis Gallinago hispidula Jacaranda ovalifolia

Insect and locality	Collected on	Date and notes
Cicadella miniticeps Fowl. - Cont'd.	Panicum barbinode Panicum maximum Phaseolus vulgaris Phytolacca octandra Pisum sativum Saccharum officinarum Schinus molle Solanum tuberosum	Tabebuia guayanae Terminalia catappa Tetragonia expansa Thespesia populnea Tripsacum latifolia Vernonia brachiata Viola odorata
Cicadella mollicella Fowl. Sareni	Capriola doctylon Panicum barbinode	April
Cicadella oecentoria (Say) San Rafael Sarchi Tres Rios	Bauvardia humboldtii Beta vulgaris crassa Brassica pekinensis Chenopodium ambrosioides Citrus sinensis Codium variegatum Crotalaria fulva Croton gossypifolium Cucurbita ficifolia Ficus carota Dombeya walliceni Eriobotrya japonica	Hibiscus rosa-sinensis Holcus sorghum Indigofera suffruticosa Ipomoea tilinoea Lagerania leucantha Musa sapientum Phaseolus lunatus Phytolacca octandra Piper auritum Poinsettia pulcherrima Radicula armorea Sapium acuparium Terminalia catappa Thespesia populnea Trifolium fragiferum
	Eucalyptus trachyphloia Fragaria chilensis Gossypium barbadense Heliotropium peruvianum Hibiscus abelmoschus	

Insect and locality	C o l l e c t e d o n	Date and notes
Cicadella pandolina Fowl.	Duranta plumieri Erythrina rubrinervia Hibiscus rosa-sinensis Mangifera indica Melaleuca leucodendron	Persea americana Schinus molle Sterculia diversifolia
Cicadella pulchella Guer. Juan Vinas Peraiso Pejivalle San Jose Santiago Sarchi	Ananas sativus Calea urticifolia axillaris Coffea arabica Heliotropium sp. Panicum barbinode Phaseolus vulgaris	Raphanus sativus Tetragonia expansa Zea mays
Cicadella reservata Fowl.	Asclepias curassavica Citrus sinensis Croton gossypifolium	Dahlia rosea Eugenia jambos
Cicadella rufopunctata Fowl. Waldeck	Theobroma cacao	
Cicadella satellas Fowl.	Passiflora quadrangularis Spondias cytherca	Tabernaemontana bigoniaeflora
Cicadella sexlineata Sign. Juan Vinas San Rafael	Ageratum conyzoides Amaranthus spinosus Baccharis nervosa Beta vulgaris crassa Boehmeria nivea Calyptranthes costaricensis	Chayote edulis Chenopodium ambrosioides Coben scandens Coleus blumei Cornutia cyrtosa Croton gossypifolium



Insect and locality	C o l l e c t e d o n		Date and notes
<i>Cicadella sexlineata</i> Sign. - Cont'd.	<p>Cucurbita ficifolia Cucurbita pepo Daturus stramonium Daucua carota Dovyalis hebecarpa Eugenia malaccensis Ficus carica Hamelia erecta Hibiscus abelmoschus Hibiscus rosa-sinensis Impatiens balsamina</p>	<p>Ipomoea tiliacea Jacobinia coccinea Lippia berlandieri Malacra radiata Morus rubra Phaseolus vulgaris Pyrus communis Raphanus sativus Spondias purpurea Terminalia catappa Zea mays</p>	
<i>Cicadella similis</i> Walk. Paso Ancho San Rafael Sarchi	<p>Artemisia absinthium Brassica japonica Byrsonima crassifolia Ceiba pentandra Cestrum aurantiacum Chayota edulis Cinnamomum camphora Coffea arabica Coix lacryma-jobi Crotalaria juncea Cupressus benthami Eschscholtzia californica Eugenia malaccensis Fragaria chiloensis Galinzoga hispida Gardenia florida Grevillea robusta Holcus sorghum Ipomoea batatas</p>	<p>Ipomoea tiliacea Iris laevigata Lactuca sativa Lippia berlandieri Morus rubra Phaseolus lunatus Psidium molle Rheedia sp. Saccharum officinarum Saccharum spontaneum Solanum tuberosum Solanum wendlandi Trifolium fragiferum Verbena sp. Vicia faba Viola odorata</p>	<p>February April October November</p>

Insect and locality	C o l l e c t e d o n		Date and notes
Cicadella testudinaria Fowl.	Asclepias curassavica	Ficus carica	July
	Bauhinia monandra	Gliricidia maculata	October
	Calliandra grandiflora	Hibiscus rosa-sinensis	November
	Calyptranthes costaricensis	Jasminum sambac	December
	Citrus limonia	Lucuma mammosa	
	Codiaeum variegatum	Malus sylvestris	
	Eugenia jambos	Tabebuia guayacan	
	Eugenia uniflora	Thespesia populnea	
		Vernonia brachiata	
		Vinca rosea	
Cicadula maidis DeLong and Wolcott Paso Ancho	Chayota edulis		January October
Deltotocephalus flavicosta Stal	Capriola dactylon Hemerocallis sp.		January February
Deltotocephalus spiroseus San Pedro Sarchi	Capriola dactylon		January to April August December
Draeculacephala lenticula Ball Juan Vinas Rio Grande San Pedro Waldeck	Canna indica Capriola dactylon Coix lacryma-jobi Grevillea robusta Panicum barbinode	Saccharum officinarum	
Draeculacephala soluta Gibs. San Pedro	Capriola dactylon Ipomoea batatas	Lactuca sativa	January

Insect and locality	C o l l e c t e d o n	Date and notes
Empoasca perelegans Oman Paraíso Paso Ancho San Pedro	Annona cherimola Annona reticulata	January March August to December
Empoasca phaeola Oman San Pedro	Phaseolus lunatus Phaseolus vulgaris	April October to February
Exitianus picatus Gibs. Paso Ancho San Pedro Sarchi	Capriola dactylon Paspalum notatum	October December - February
Graphocephala coccinea (Forst.) Juan Vinas Paso Ancho San José Sarchi	Acnistus arborescens Allamanda cathartica Boehmeria nivea Bombax ellipticum Canarium odoratum Carissa grandiflora Cinnamomum camphora Citrus aurantium Citrus limonia Citrus paradisi Citrus sp. (toronjo) Clerodendron fragrans Coix lacryma-jobi Conocarpus velutina Cupressus benthami Cytisus fragrans Dahlia rosea Datura candida	Duranta plumieri Ficus carica Fortunella japonica Fortunella margarita Grevillea robusta Impatiens balsamina Jacobinia coccinea Jatropha aconitifolia Ligustrum japonicum Melaleuca leucadendron Pelargonium zonale Persica pitiaria Plumeria rubra Spondias cytherea Sterculia diversifolia Tabebuia pentaphylla Terminalia catappa Thunbergia erecta



Insect and locality	C o l l e c t e d o n	Date and notes
Graphocephala sanguinolenta Coqueb. Waldack	Musa sapientum Theobroma cacao	April July
Graphocephala rufimargo Walk. San Rafael Santiago Sarchi	Abutilon sp. Capriola dactylon Zea mays	January February August
Graphocephala limbaticollis Stal Paraiso Paso Ancho San Jose Tres Rios	Aenistus arborescens Asclepias curassavica Canarium odoratum Citrus limonia Colocasia esculenta Croton gossypifolium Dombeya wallichii Erythrina rubrinervia	October
Graphocephala versuta (Say)	Citrus aurantium Eucalyptus trachypholia Eugenia jambos Fortunella japonica Hibiscus rosa-sinensis Hymenaea courbaril	Euphorbia neofianiana Hibiscus rosa-sinensis Inga laurina Jatropha acnitifolia Malus sylvestris Piper auritum Sapium acuparium Spondias cytherea  Inga edulis Inga laurina Ligustrum japonicum Stereulia diversifolia Verbesina turbaensis
Gypona praeterita Fowl. Desamparados Waldack	Elaeis guineensis Galinzoga hispida	July October
Gypona puncticollis Spong. San Pedro	Panicum barbinode	April

Insect and locality	C o l l e c t e d o n	Date and notes
Gypona vinula Stal San Pedro	Aenistus arborescens Panicum barbinode	August
Gypona signoreti Stal El Pisote San Pedro	Hamelia erecta	November January
Gypona vulnerata Walk. Tres Rios	Aenistus arborescens Ageratum conyzoides Albizia lophantha Alnus acuminata Ammonia muricata Baccharis nervosa Bixa orellana Byrsosmia crassifolia Calliandra grandiflora Callistemon lanceo- latus Canarium odoratum Castanea sativa Cestrum lanatum Chayota edulis Cinnamomum camphora Citrus aurantifolia Citrus medica Croton gossypifolium	Duranta plumieri Eriobotrya japonica Eucalyptus trachypho- ia Ficus religiosa Fortunella japonica Grevillea robusta Malus sylvestris Melaleuca leucaden- dron Pelargonium zonale Phaseolus lunatus Prunus salicina Pyrus communis Rosa sp. Solanum torvum Spondias cytherea
Kolla fasciata (Walk.)	Ageratum conyzoides Panicum barbinode Thespesia populnea	

Insect and locality	C o l l e c t e d o n	Date and notes
Kolla geometrica (Sign.)	Cleome spinosa Croton gossypifolium Grevillea robusta Hedychium coronarium Musa sapientum	Sapium sp. Solanum aculeatissimum Solanum tuberosum Tabebuia guayacan
Oncometopia undata (F.)	Citrus aurantium Citrus limonia Cocos nucifera Dahlia rosea Eugenia malaccensis Helianthus annuus	Hibiscus sabdariffa Lantana trifolia Passiflora edulis Pelargonium zonale Rosa sp.
Osbornellus mexicanus Osb. Paso Ancho San Pedro	Annona cherimola Cappirola dactylon Chaetochia edulis Coreopsis lanceolata Cosmos sulphureus Gomphrena globosa Ipomoea batatas Ipomoea tiliacea	Parkinsonia aculeata Pelargonium zonale Persea americana Phaseolus lunatus Phaseolus vulgaris Tournefortia foetidisima Vinca rosea
Phara obtusifrons Fowl. San Pedro	Calistemon lanceolatus Carissa grandiflora Coix lacryma-jobi	Hibiscus rosa-sinensis March Saccharum officinarum Zea mays
Platymetopus frontalis Van D. Paraiso Paso Ancho San Jose San Pedro Waldeck	Aenistus arborescens Amaranthus paniculatus Calyptanthus costaricensis Capsicum annuum	Cinnamomum camphora Cissus sicyoides Citrus sinensis Clerodendron fragrans Crotalaria spectabilis



Insect and locality	C o l l e c t e d o n	Date and notes
Platymetopius frontalis Van D. - Cont'd.	Cyclanthera pedata Dahlia rosea Datura candida Dombeya wallichii Ficus carica Galinzoza hispidula Gomphrena globosa Grevillea robusta Guarea caoba Hibiscus rosa-sinensis Impatiens balsamina Ipomoea tiliacea Jacaranda ovalifolia Lagerfloria leucantha Malacra radiata Persen americana Phaseolus vulgaris	Poinsettia pulcherrima Rapiunus sativus Sambucus mexicana Solanum tuberosum Spondias cytharea Tabernaemontana coronaria Tetragonia expansa Thespesia populnea Verbena sp. Vernonia brachiata Vicia faba Viola odorata Vitis tiliacifolia Zea mays
Protalebra decrata San Pedro	Vernonia brachiata	March, April, October to January
Spanbergiella mexicana Bak. San Pedro	Panicum barbinode	April
Stirellus bicolor (Van D.) Farba El Pisote San Pedro	Chayota edulis Pennisetum clandestinum	October November
Thamnotettix comatus (Ball) Juan Vinas Paso Ancho San Pedro Sarchi	Capriola dactylon Paspalum notatum	August October December to February

Insect and locality	Collected on	Date and notes
Thamnotettix fasciaticollis (Stal) ? San Pedro San Rafael	Annona squamosa Brassica japonica Caesalpinia pulcherrima Capriola dactylon Casimiroa edulis Cedrela montana mexicana Cestrum lanatum Cestrum macrophyllum Citharexylum caudatum Citrus aurantium Citrus limonia Citrus nobilis Crotalaria spectabilis	August to March May
Xestocephalus tessellatus Van D. San Pedro San Rafael	Cucurbita pepo Dombeya wallichi Ficus religiosa Hibiscus rosa-sinensis Ligustrum japonicum Lippia berlandieri Phytolacca octandra Pisum sativum Saccharum officinarum Solanum tuberosum Tetragonia expansa Vicia faba	February April
COCCIDAE Asterolecanium bambusae Boisd. San Isidro del General	Panicum barbinode Tripstacum latifolia Bambusa sp.	August
Aulacaspis pentagona (Targ.)	Amygdalus davidiana Schinus molle	Chilocorus cacti L. is predacious on this scale.

Insect and locality	C o l l e c t e d o n	Date and notes
Ceroplastes floridensis Comst. Alajuela San Pedro San Rafael	Beaumontia grandiflora Casimiroa edulis Citrus aurantium Citrus limonia Citrus nobilis Cydonia oblonga	Ficus religiosa Guarea caoba Nephrolepis sp. Persea americana Plumeria rubra
Chrysomphalus dictyospermi (Morg.)	Garcinia tinctoria	February August
Coccus acuminatus (Sign.) Paso Ancho Tres Rios	Gardenia florida Ixora chinensis	August September December
Coccus hesperidum (L.) San Miguel del Sur de Santo Domingo de Heredia	Achyranthes aspera Carissa grandiflora Chamaedora bifurcata Citrus mitis Citrus nobilis Diospyros virginiana	April August October December to February
Coccus viridis (Green) San Isidro del General	Citrus sinensis	August
Eriococcus araucariae Mask. San Pedro Tres Rios	Araucaria excelsa	May September
Hemichionaspis aspidistrae (Sign.) Limón San Pedro	Nephrolepis sp.	March May Serious injury to ferns



Insect and locality	C o l l e c t e d o n	Date and notes
<i>Icerya montserratensis</i> Riley and Howard San Pedro	<i>Cyphomandra</i> betacea	November
<i>Ischnaspis longirostris</i> (Sign.) Tres Rios	<i>Chrysalidocarpus</i> latescens	September
<i>Lepidosaphes beckii</i> (Newm.)	<i>Citrus aurantium</i> <i>Citrus limonia</i>	Almost completely controlled by fungus <i>Sphaero</i> <i>stilbe coccophila</i> .
<i>Orthezia insignis</i> Dougl. San Rafael	<i>Ruta graveolens</i> <i>Solanum pseudocapsicum</i>	January February, June
<i>Pseudischnaspis bowreyi</i> (Ckll.)	<i>Hicoria pecan</i> <i>Prunus salicina</i>	Serious injury to <i>Sterculia</i> and cocan
<i>Pseudococcus citri</i> (Risso)	<i>Citrus trifoliata</i> <i>Fortunella japonica</i> <i>Persen americana</i>	January March April
<i>Pseudococcus nipae</i> (Mask.)	<i>Anacardium occidentale</i>	October
<i>Pseudococcus virgatus</i> (Ckll.) San Pedro	<i>Althaea rosea</i>	December
<i>Pulvinaria psidii</i> Mask. San Rafael	<i>Garcinia tinctoria</i> <i>Phyllanthus angustifolia</i>	<i>Plumeria rubra</i>
<i>Rhizococcus coffeae</i> Ling Sabanilla	<i>Coffea arabica</i>	November      Serious damage

Insect and locality	C o l l e c t e d o n		Date and notes
Saissetia hemisphaerica (Targ.) San Francisco San Rafael Santa Ana	Amnona cherimola Asparagus plumosus Bauhinia monandra Beaumontia grandiflora Callistemon lanceolat- us Carissa grandiflora Cestrum aurantiacum Chrysophyllum cainito Citrus nobilis Codiaeum variegatum Congea velutina Cydonia oblonga Erythrina rubrinervia Eugenia jambos Eugenia malaccensis Ficus carica	Fortunella japonica Garcinia tinctoria Gonolobus edulis Guazuma ulmifolia Ixora chinensis Lagerstroemia indica Lagerstroemia speci- osa Mangifera indica Piper auritum Phyllanthus angusti- folia Plumeria rubra Spondias cytherea Sterculia diversifo- lia Trichilia havensis	
Saissetia oleae (Bern.)	Bauhinia monandra Chrysophyllum cainito	Citrus nobilis Thunbergia erecta	November
FULGORIDAE			
Acanalonia virescens (Stal)	Chayote edulis	Tournefortia foeti- dissima	March, April,
	Citrus sinensis	Vernonia brachiata	October
Bothriocera tinealis (Klug)	Piper auritum	Verbesina turbacensis	January, October
Colgorma proxima (Fowl.) Paso Ancho	Croton gossypifolium		August

Insect and locality	C o l l e c t e d o n	Date and notes
Colpoptera sp. San Rafael Sarchi Waldeck	Aenistus arborescens Ageratum conyzoides Begonia sp. Blakea gracilis Buddleia davidi Caladium bicolor Cattleya skinneri Cestrum aurantiacum Cestrum nocturnum Chenopodium ambrosi- oides Citrus aurantifolia Citrus sinensis Coleus blumei Congea velutina Cucurbita pepo Cupressus benthami Datura candida Datura stramonium Dieffenbachia sp. Eriobotrya japonica Eugenia uniflora Ficus carica Fragaria chiloensis	Hamelia erecta Hibiscus esculentus Impatiens sultani Ipomoea tiliacea Jacobinia coccinea Lycopersicum esculen- tum Myosotis sylvatica Passiflora quadrang- ularis Persea americana Petunia hybrida Poinsettia pulcher- rima Raphanus sativus Ricinus communis Salvia splendens Solanum muricatum Solanum nigrum Solanum seaforthianum Theobroma cacao Tropaeolum majus Zea mays
Colpoptera sinuata Burm. Waldeck	Theobroma cacao	July
Copicorus innotatus Swartz San Pedro	Aenistus arborescens Ageratum conyzoides Croton gossypifolium	Hibiscus rosa-sinensis March Rumex crispus August Tournefortia foetida dissimilis September



Insect and locality	C o l l e c t e d o n	Date and notes
Cotyleceps maculata Fowl. Waldeck	Theobroma cacao	April
Delphacodes nigra Crawford. San Pedro	Gramineae (grass)	February
Delphacodes nigrofasciatus Muir Juan Vinas San Pedro	Gramineae (grass)	August October
Delphacodes propinqua Fieb. San Pedro Sarchi	Capriola dactylon Galinzoga hispida	January February
Liburnia teapae Fowl. San Pedro	Coleus blumei Gramineae (grass)	February
Dictyophara herbida (Walk.) Waldeck	Elaeis guineensis Theobroma cacao	July
Dictyophara obtusifrons (Walk.) Rio Grande	Gramineae	February
Epibidius godmani Fowl. Waldeck	Theobroma cacao	July
Flatoides humeralis Walk. Guadalupe San Pedro	Amygdalus persica Citrus limonia Croton gossypifolium	February April December
Gaetulia plenipennis (Walk.) Waldeck	Theobroma cacao	July

Insect and Locality	Collection	Date and notes
Oecleus addendus Fowl. Juan Vinas	Coffea arabica	August
Peregrinus maidis (Ashm.) San Pedro	Zea mays	August
Sogata furcifera Horv. San Pedro	Phaseolus vulgaris	October
MEMBRACIDAE		
Aconophora nitida Fowl. Juan Vinas	Coffea arabica	May August
Aconophora pallescens Stal La Caja Pejivalle San Rafael	Acnistus arboreus Amygdalus persica Boehmeria nivea Calyptranthes costaricensis Canarium odoratum Cestrum macrophyllum Dovyalis hebecarpa Eugenia uniflora	Ficus religiosa Fortunella japonica Grevillea robusta Hicoria pecan Lagerstroemia indica Parkinsonia aculeata Prunus armeniaca Pyrus communis
Acutalis fusconervosa Fairm. Paso Ancho Turrialba	Dahlia rosea Musa sapientum	July August
Aethalion reticulatum (L.)	Bauhinia purpurea Fortunella japonica Grevillea robusta Jacaranda ovalifolia	March August October

Insect and locality	C o l l e c t e d o n	Date and notes
Alchisme grossa (Fairm.) San Pedro	Coffea arabica Inga tonduzii	July October
Anastris obtegens (F.) Waldeck	Theobroma cacao	July
Antianthe expansa (Germ.) Paraíso San Rafael	Cestrum nocturnum Ipomoea batatas Verbesina turbacensis	
Bolbonota inaequalis (Fairm.) Juan Vinas Paraíso Santiago Siquirres Turrialba Waldeck	Acalypha hispida Alnus acuminata Amygdalus persica Anacardium rhinocarpus Annona muricata Bauhinia purpurea Byrsonima crassifolia Casimiroa edulis Cassia sophora Cestrum macrophyllum  Cestrum nocturnum Citrus aurantifolia Citrus nobilis	Conostegia lanceolata Garcinia tinctoria Grevillea robusta Hibiscus rosa-sinensis Inga edulis Lagerstroemia speciosa Piper auritum Racedia sp. Spondias cytherea Theobroma cacao Thespesia populnea Verbesina turbacensis Vernonia brachiata
Bolbonota insignis Fowl. Alajuela La Caja Paso Ancho San Francisco de Dos Rios San José	Acalypha hispida Acalypha wilkesiana Aenistus arborescens Anacardium occidentale Annona cherimola Annona muricata	December



Insect and locality	C o l l e c t e d o n	Date and notes
Bolbonota insignis Fowl.- Cont'd.	Codineum variegatum Cynademuim sp. Dania rosea Dovyalis hebecarpa Lagerstroemia speciosa Spondias cytherea	Spondias purpurea Tamarindus indica Thespesia populnea Vernonia brachiata Zea mays
Campylocentrus hamifer (Fairm.) Gundalupe	Coffea arabica Gonolobus edulis	Petiveria alliacea  February, June, October, November
Campylocentrus pusillus (Fairm.) El Pisote San Pedro Tres Rios	Cucurbita ficifolia Cucurbita pepo Gramineae (grass)	Ipomoea tiliacea Zea mays  January July September
Ceresa testacea Fairm. Paraíso Paso Ancho San Pedro San Rafael	Amygdalus persica Celosia cristata Cupressus benthami Dahlia rosea Erythrina rubrinervia	Musa sapientum Parkinsonia aculeata  February April July to September
Ceresa vitulus (F.) San Pedro	Chayota edulis Ipomoea tiliacea	Ipomoea purga  February March, October
Ceresa vitulus minor Fowl. Juan Vinas Waldeck	Elacis guineensis Erythrina glauca	July
Cyphonia clavata (F.) Waldeck	Theobroma cacao	July
Enchenopa binotata (Say) San Pedro	Amygdalus persica Annona squamosa Bauhinia purpurea	Bauhinia violacea Cestrum macrophyllum Citrus nobilis X C. paradisii  January February, April May, August, September, November,

Insect and locality	Collected on	Date and notes
Enchenopa binotata (Say) - Cont'd.	Cydonia oblonga Diphyse robinoides Erythrina rubrinervia Eugenia uniflora	Hymenaea courbaril Malus sylvestris Melilotus alba Parkinsonia aculeata
Enchenopa lanceolata (Stoll) San Rafael	Annona muricata Conostegia lanceolata	Cydonia oblonga
Enchophyllum dabium Fowl. San Pedro	Persea americana	May
Entylia sinuata (F.) Paraiso San Rafael	Acnistus arborescens Ageratum conyzoides Beta vulgaris crassa Cupriola dactylon Cedrela montana mexi- cana Cestrum macropayllum Chayota edulis Clerodendron fragrans Datura candida Daucus carota Eriobotrya japonica	Galinzoga hispida Hymenaea courbaril Nicotiana tabacum Panicum barbinode Pelargonium zonale Pyrus communis Solanum aculeatis- simum Tournefortia foeti- dissima Verbesina turbacensis
Erechtia sellaei (Fowl.) Alajuela	Byrsonima crassifolia Canarium odoratum	Persea americana
Horioia arcuata (F.) San Vinas Waldeck	Coffea arabica Theobroma cacao	April May
Horioia composita Walk. Waldeck	Theobroma cacao	July

Insect and locality	Collected on	Date and notes
<i>Hortola picta</i> (Coque.) Santiago Turrialba	<i>Cassia spectabilis</i> <i>Citrus limonia</i> <i>Eugenia jambos</i>	July August
<i>Membracis mexicana</i> Guer. Santa Ana Siquirres	<i>Acalypha wilkesiana</i> <i>Alnus acuminata</i> <i>Bauhinia monandra</i> <i>Bauhinia violacea</i> <i>Byrsonima crassifolia</i> <i>Cestrum macrophyllum</i> <i>Chrysophyllum cainito</i> <i>Codiaeum variegatum</i> <i>Crotalaria striata</i> <i>Cupressus benthami</i> <i>Enterolobium cyclocarpum</i>	Causes considerable damage by oviposition
<i>Micrutalis ephippium</i> (Burn.) San Pedro	<i>Anacardium paniculatus</i> <i>Anacardium spinosum</i>	January March to May
<i>Micrutalis lugubrina</i> (Stal) San Pedro	<i>Cornutia cynosa</i>	March
<i>Potnia brevicornis</i> Fowl. San Pedro	<i>Xylosma</i> sp.	August, October, December
<i>Pterygia bituberculata</i> Fowl. La Caja	<i>Coffea arabica</i>	May
<i>Spongoporus ballista</i> (Germ.) Guadalupe	<i>Chayota edulis</i> <i>Coffea arabica</i> <i>Crotalaria striata</i>	January, June, July, August, December



Insect and locality	C o l l e c t e d o n		Date and notes
Stictoccephala festina (Say) Paso Ancho San Rafael	Amygdalus persica Annona reticulata Beta vulgaris crassa Capriola dactylon Cassia sp. Dahlia rosea Fragaria chiloensis Galinzoga hispida Grevillea robusta Ipomoea tiliacea Lippia berlandieri Melaleuca leucaden- dron	Punica granatum Solanum aculeatissimum Solanum tuberosum Thespesia populnea Trifolium fragiferum Tripsacum latifolia Vicia faba Vitis labrusca Vitis rotundifolia Vitis vinifera Zea mays	March August October November
Umbonia crassicornis (Amy. and Serv.) Aserrises Santa Ana	Gazania ulmifolia Inga laurina Inga spuria Inga tonduzii	Parkinsonia aculeata	February April August
Vandenea segmentata (Fowl.) San Pedro Santa Ana Santiago Siquirres Waldeck	Acalypha wilkesiana Bauhinia monandra Bauhinia violacea Cassia sophora Cupressus benthami Mimosa asperata	Theobroma cacao	April July August December Very harmful to <u>Cassia sophora</u>
H E M I P T E R A			
Acanthocephala bicoloripes (Stal) Waldeck	Theobroma cacao		July
Acanthocephala declivis guate- malens. Dist.	Annona muricata	Fortunella margarita	

Insect and locality	Collection	Date and notes
<i>Acroleucus brevicollis</i> (Stal) San Pedro	Canarium odoratum	August
<i>Acrosternum marginatum</i> (Beauv.) San Pedro	Zea mays	September
<i>Alrocoris elegans</i> McA. & M. Paso Ancho	Dahlia rosea	August
<i>Anasa andresii</i> (Guer.) San Jose	<i>Chayota edulis</i> <i>Cucurbita ficifolia</i> <i>Dahlia rosea</i>	January July
<i>Anasa madida</i> Dist. San Pedro	<i>Acnistus arborescens</i> <i>Persea americana</i>	February December
<i>Anasa bellator</i> (F.) Waldeck	<i>Elaeis guineensis</i>	July
<i>Anasa scorbatica</i> (F.) San Jose	<i>Amygdalus persica</i> <i>Chayota edulis</i>	July September
<i>Castolus plagiaticollis</i> Stal San Rafael Waldeck	<i>Theobroma cacao</i> <i>Panicum barbinode</i>	February April
<i>Cebrenis modesta</i> Dist. San Pedro	<i>Vernonia brachiata</i>	March
<i>Chariesterus moestus</i> Burm. Santa Ana	<i>Pedilanthus tithymal-</i> <i>oides</i>	April
<i>Chlorocoris aberrans</i> Dist. San Pedro	<i>Citrus sinensis</i>	March

Insect and locality	C o l l e c t e d o n	Date and notes
Collaria oleosa Dist. El Pisote San Rafael Terrialba	Ageratum conyzoides Chayota edulis Coffea arabica Coix lacryma-jobi	Pennisetum purpureum Phaseolus lanatus Saccharum officinarum Saccharum spontaneum
Corecoris fusca (Thunb.) San Jose San Pedro	Ageratum conyzoides Chayota edulis Coffea arabica	April to October
Corizus hyalinus (F.) San Pedro	Lactuca sativa	February
Corizus pictipes (Stal) San Pedro	Hibiscus rosa-sinensis Malacra radiata	February July
Corizus sidac F. Waldeck	Theobroma cacao	July
Cosmopepla coerulescens Montd. San Jose	Daucus carota Ipomoea sp.	January August, October
Creontiades rubrinervus (Stal) San Jose	Asparagus officinalis Chayota edulis Cupressus benthami Cucurbita pepo	Datura suaveolens Dianthus caryophyllus Impatiens balsamina Tetragonia expansa
Cyrtocapsus caliginosus (Stal) San Pedro	Ipomoea batatas Ipomoea tiliacea	January April
Debilis angustata Champ. Waldeck	Theobroma cacao	July
Dysdercus flavolimbatus Stal Waldeck	Sida rhombifolia	July



Insect and locality	C o l l e c t e d o n	Date and notes
Dysdercus mimulus Hussey San Pedro San Rafael	Chayota edulis Ipomoea batatas Myosotis sylvatica	Nephrolepis sp. February to April October
Dysdercus obliquus (H. S.) Desamparades	Acalypha wilkesiana Boehmeria nivea Datura candida Dombeya wallichii Galinzoga hispida	Hibiscus abelmoschus Impatiens balsamina Malacra radiata Malus sylvestris Morus rubra June, Important injury September, to <u>Hibiscus</u> to <u>abelmoschus</u> December
Dysdercus oncopeltus Dist. Liberia	Saccharum officinarum	February
Ecclitotarsus pallidirostris Stal San Pedro	Ipomoea tiliacea	January
Edessa cornuta Burm. El Pisote San Jose Santiago	Acnistus arborescens Brassica japonica Brassica rapa Chayota edulis Citrus limonia	June July September
Edessa junix Stal San Pedro	Erythrina rubrinervia	October
Edessa nigrispina Dallas Las Juntas de Abangares	Oryza sativa	
Edessa rufomarginata (De Ge.) San Lazaro	Sida rhombifolia	March

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Euryophthalmus cinctus</i> (H.S.) Juan Vinas Rosario de Marunjo San Rafael	<i>Chrysanthemum maximum</i> <i>Coffea arabica</i> <i>Inga patana</i>	February August November
<i>Euschistus bifibulus</i> (Beauv.) San Pedro Turrialba	<i>Cestrum macrophyllum</i> <i>Chayota edulis</i> <i>Hibiscus schizopetalus</i>	April to July October
<i>Euschistus crenator</i> (F.) Waldeck	<i>Theobroma cacao</i>	April
<i>Gargaphia patricina</i> (Stal.) Gadalupe	<i>Coffea arabica</i> <i>Erythrina rubrinervia</i>	October
<i>Halticus bractatus</i> (Say) Mayalar	<i>Artemisia absinthium</i> <i>Asparagus plumbosus</i> <i>Beta vulgaris crassa</i> <i>Bidens pilosa</i> <i>Brassica japonica</i> <i>Brassica pekinensis</i> <i>Chayota edulis</i> <i>Coreopsis lanceolata</i> <i>Cucumis melo</i>	June Very destructive August to melons October
<i>Hermes guttata</i> (Dallas) San Pedro	<i>Datura stramonium</i> <i>Daucus carota</i> <i>Galinsoga hispida</i> <i>Lycopersicon esculentum</i> <i>Phytolacca octandra</i> <i>Raphanus sativus</i> <i>Trifolium fragiferum</i> <i>Verbena</i> sp.	November
<i>Hera similis</i> Stal Gadalupe Waldeck	<i>Coffea arabica</i> <i>Theobroma cacao</i>	July October

Insect and locality	C o l l e c t e d o n	Date and notes
Hypselonotus atratus Dist. Juan Vinas Pejivalle San Rafael Santiago	Chrysanthemum maximum Colocasia esculenta Crotalaria striata Cupressus benthami Impatiens balsamina Inga paterno Melanthera aspera	August October
Hypselonotus loratus Bredd. Waldeck	Sida rhombifolia	July
Iscnodemus sallaci (Sign.) San Pedro Paso Ancho	Canna indica	August to December
Lampethusa anatina Dist. San Pedro	Chayota edulis	August
Leptocoris tipuloides (Deg.) San Jose	Annoma cherimola	August
Leptoglossus stigma (Hbst.)	Citrus nobilis Cyphomandra betacea	February to May
Leptoglossus zonatus (Dallas) Paraiso San Jose Santiago Sarchi	Asparagus officinalis Chayota edulis Citrus aurantium Cupressus benthami Datura stramonium	
Ligyrocoris litigiosus (Stal) San Pedro	Averrhoa carambola Fragaria chiloensis	January May
	Musa sapientum Panicum barbinode Phaseolus vulgaris Solanum torvum Triumfetta josefina Tropaeolum majus	
	Persca americana Psidium guajava	
	Helianthus annuus Malus sylvestris Poinsettia pulcherrima Vigna sesquipedalis	



Insect and locality	C o l l e c t e d o n	Date and notes
<i>Lygrocoris multispinus</i> Stal San Pedro	<i>Ligustrum japonicum</i> <i>Phaseolus vulgaris</i>	January October
<i>Lygceus bistrigularis</i> Say Barba	<i>Annona squamosa</i> <i>Pennisetum clandestinum</i>	November
<i>Lygceus reclinatus</i> Say	<i>Asclepias curassavica</i>	April
<i>Lygceus uhleri</i> Stal San Pedro	<i>Zea mays</i>	July
<i>Lygus sallei</i> Stal San Pedro San Rafael	<i>Annona reticulata</i> <i>Beta vulgaris crassa</i> <i>Datura suaveolens</i> <i>Galinsoga hispida</i>	December to April
<i>Mecistorhinus tripterus</i> (F.) Siquirres Waldeck	<i>Hibiscus rosa-sinensis</i> <i>Theobroma cacao</i>	July
<i>Monanthia monotropidia</i> Stal La Caja	<i>Cassia spectabilis</i>	May
<i>Mormidea notulata</i> (H. S.) Gadalupe San Pedro San Rafael	<i>Chayota edulis</i> <i>Coffea arabica</i> <i>Panicum barbinode</i> <i>Zea mays</i>	February July to October
<i>Myrochla unispinosa</i> Stal Waldeck	<i>Theobroma cacao</i>	April

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Neurocolpus mexicanus</i> Dist. San Pedro	<i>Myosotis sylvatica</i> <i>Vicia faba</i>	January
<i>Hexera viridula</i> (L.)	<i>Bixa orellana</i> <i>Chayota edulis</i> <i>Crotalaria striata</i> <i>Lippia berlandieri</i>	January March
<i>Nysius californicus</i> Stal San Pedro	<i>Tetragonia expansa</i> <i>Galinsoga hispida</i>	January May
<i>Nysius emontitus</i> Dist. San Pedro Santa Lucia	<i>Ageratum conyzoides</i> <i>Liopia berlandieri</i>	January February December
<i>Orthaea bilobata</i> (Say) Paso Ancho San Pedro	<i>Chayota edulis</i> <i>Dahlia rosea</i> <i>Zea mays</i>	June August
<i>Ortholomus jamaicensis</i> Dallas San Pedro	<i>Tetragonia expansa</i>	May
<i>Pachycoris torridus</i> (Scop.) Guadalupe	<i>Annona cherimola</i> <i>Coffea arabica</i> <i>Croton gossypifolium</i> <i>Eriobotrya japonica</i> <i>Erythrina rubrinervia</i>	February March August
<i>Padaeus viduus</i> (Voll.) San Pedro San Rafael	<i>Chayota edulis</i> <i>Hibiscus rosa-sinensis</i>	February October

Insect and locality	C o l l e c t e d o n	Date and notes
Pangaeus piceatus Stal San Pedro	Casuarina equisetifolia Coffea arabica Colocasia esculenta	January June October
Paracalocoris annulatus Dist.	Amygdalus persica Chayota edulis Citrus limonia Diospyros virginiana	January Phaseolus vulgaris Poinsettia pulcherrima Zea mays
Paracalocoris jurgiosus (Stal) San Pedro	Chayota edulis	July to September
Paracalocoris molliculus Dist. San Pedro	Tortunella japonica Gerbera jamesoni Persea americana	January December
Piesma cinerea (Say) San Pedro	Amaranthus spinosus	April
Platycarenum humilis (H.S.) Waldeck	Theobroma cacao	July
Platytylhellus latipennis (Stal) Grecia San Pedro	Gramineae (grass) Hibiscus rosa-sinensis	February August
Polymerus cuneatus (Dist.)	Amaranthus paniculatus cruentus Amaranthus spinosus	January March April
Proxys punctulatus (Beauv.) San Pedro	Verbesina turbanensis	March



Insect and locality	Collected on	Date and notes
<i>Proxys victor</i> (F.) Waldeck	<i>Theobroma cacao</i>	April
<i>Pycnoderes atratus</i> (Dist.) San Pedro	<i>Phaseolus vulgaris</i>	October
<i>Pycnoderes incurvus</i> (Dist.) Paraiso	<i>Coccyta edulis</i> <i>Chrysophyllum cainito</i>	January
<i>Repipta flavicans</i> (Amy. & Serv.) Waldeck	<i>Theobroma cacao</i>	April
<i>Repipta taurus</i> (F.) Waldeck	<i>Theobroma cacao</i>	July
<i>Spilictyrtus longirostris</i> Dist. San Pedro	<i>Costus sanguineus</i>	January
<i>Staluptus marginalis</i> Burm. San Jose San Pedro	<i>Poinsettia pulcherrima</i> <i>Vernonia brachiata</i>	February September to December
<i>Stenomacrus marginella</i> (n.S.)	<i>Amgdalus davidiana</i> <i>Camellia japonica</i> <i>Canarium odoratum</i> <i>Cestrum marginella</i> <i>Chalcas exotica</i> <i>Chayote edulis</i> <i>Citharexylum caudatum</i> <i>Congoa velutina</i> <i>Croton gossypifolium</i> <i>Datura candida</i> <i>Dombeya wallichii</i> <i>Eugenia uniflora</i> <i>Ficus carica</i>	<i>Fortunella japonica</i> <i>Galinzoga hispid</i> <i>Grevillea robusta</i> <i>Hamelia erecta</i> <i>Heliotropium indicum</i> <i>Hibiscus rosa-sinensis</i> <i>Hicoria pecan</i> <i>Ipomoea batatas</i> <i>Lucuma mammosa</i> <i>Melaleuca leucodendron</i> <i>Piper auritum</i> <i>Terminalia catappa</i>

Insect and locality	Collected on	Date and notes
Zicca tenuicola (Dollins) San Jose San Pedro	Amaranthus paniculatus cruentus Amaranthus spinosus Brassica oleracea capitata	January April July to September
HYMENOPTERA		
Aegochlora seminigra Ckll. Waldeck	Theobroma cacao	July
Dephrata maculicollis Cam. San Pedro Waldeck	Annona cherimola Annona muricata	July A chalcid attacking seed and ruining the fruit
Ectatomma ruidum Roger Waldeck	Theobroma cacao	April July
Gymnopolobia sulfureofasciata Buckl. San Pedro	Annona cherimola Eyrsonima crassifolia Cupressus benthami Hedychium coronarium	December Gather tomentum from leaves of variety of plants. January February November
Halictus pseudotegularis Ckll. Waldeck	Theobroma cacao	July
Megalonota idalia Smith Waldeck	Theobroma cacao	July

Insect and locality	Collected on	Date and notes
Polistes major Beauv. San Lazaro	Man	March This wasp inflicts serious sting, causing difficulty in breathing
Rhopalictus lachnes Bacnal San Pedro	Ageratum conyzoides	January
Selenopcis seminata (F.) Siquirres	Bauhinia purpurea Carissa grandiflora Cassia sophora Cestrum macrophyllum Citrus trifoliata Diospyros virginiana	July to February May Fosters <u>Vanduza</u> <u>segmentata</u> Fowl., and various coccids.
Scolochalcis femorata (F.) Waldeck	Theobroma cacao	July
Tatus tatus (Cuvier) San Pedro San Rafael	Citrus medica Tripsacum latifolia	February
Trigona analthera (Oliv.) Alajuela Waldeck	Byrsonima crassifolia Elaeis guineensis	July October
Trigona cupira Smith Waldeck	Citrus limonia Eschscholtzia californica	January March April, July
Trigona townsendi Coll. Pejivalle	Man	February A sweet bee



# LEPIDOPTERA

Insect and locality	Collected on	Date and notes
<i>Acraea</i> con Schaus San Pedro	<i>Citrus nobilis</i> x para- disi	January August
<i>Agrotis melantho</i> (Bates) San Jose	<i>Cyphomandra</i> betacea	August
<i>Automeris boucardi</i> Druce San Rafael	<i>Coffea arabica</i> <i>Trema micrantha</i>	Larva attacked by the wasps <i>Gymnopolybia sul-</i> <i>fureofasciata</i> Buckl. and <i>Parachartergus apicalis</i> (F.)
<i>Bertholdia specularis</i> (H.S.) Guadalupe	<i>Coffea arabica</i> <i>Psidium guajava</i>	February March
<i>Diapania nitidalis</i> (Stoll) Cajal San Pedro	<i>Cucumis sativus</i> <i>Cucurbita pepo</i>	February A very serious December pest of melons
<i>Dicentria sabella</i> San Pedro	<i>Lagerstroemia speciosa</i>	March Serious damage to April queen crepe myrtle November, December
<i>Dicentria violascens</i> (H.S.)	<i>Dombeya wallichi</i> <i>hickoria pecan</i>	December Defoliating trees January
<i>Eantis pallida</i> (Feld.)	<i>Citrus medica</i> <i>Citrus nobilis</i> X para- disi	
<i>Euchaetes mitis</i> Schaus San Pedro	<i>Gonolobus edulis</i>	March, May, June, December, January

Insect and locality	Collected on	Date and notes
<i>Euglyphis castalia</i> (Druce) San Pedro	<i>Persea americana</i>	April
<i>Euglyphis melancolica</i> (Eatl.)	<i>Phoebe tonduzii</i>	September
<i>Gloveria balloui</i> Schaus San Pedro	<i>Conostegia lanceolata</i> <i>Psidium guajava</i>	December January
<i>Halisidota schausi</i> Rothsch. San Pedro	<i>Morus rubra</i>	November
<i>Hemerocampa costaricensis</i> Schaus	<i>Cydonia oblonga</i> <i>Malus sylvestris</i> <i>Persea pittieri</i>	September to March Prunus salicina Rosa sp.
<i>Licnophora cavillator</i> Walk. San Jose San Pedro San Rafael	<i>Anacardium rhinoceros</i> <i>Annona cherimola</i> <i>Cedreia montana mexicana</i>	November to January August Malacra radiata Pelargonium zonale
<i>Lycorea atergatis</i> (Doubl. and Hewits.) San Pedro	<i>Ficus carica</i>	November December
<i>Mesocondyla concordalis</i> Hbn.*	<i>Tabebuia pentaphylla</i>	Defoliating trees
<i>Opsiphanes corrosus</i> Stick. San Pedro	<i>Musa paradisica</i>	August
<i>Papilio polydames</i> L. San Pedro	<i>Aristolochia regens</i>	December 21 Ovipositing

\* In the Supplement to No. 4 of the Insect Pest Survey Bulletin, Vol. 15, 1935, p. 208, this insect was incorrectly reported as occurring on Couratler rosea.

Insect and locality	Collected on	Date and notes
<i>Papilio polyxenes stabilis</i> R. and J. San Pedro	<i>Apium ammi</i>	January November
<i>Papilio thoas</i> autocles Rothschild Sarchi	<i>Citrus aurantium</i> <i>Citrus paradisi</i>	August to February Damaging <u>C. aurantium</u> . Eggs and larvae October 2 to January 4
<i>Phobetron hipparchia</i> Cram. Paso Ancho	<i>Anacardium rhinocarpus</i> <i>Annona cherimola</i> <i>Annona squamosa</i> <i>Calyptanthus costaricensis</i>	September to December
<i>Pieris elodia</i> Boisd. Paso Ancho San Rafael	<i>Brassica pekinensis</i> <i>Tropaeolum majus</i>	February A serious pest December of nasturtium
<i>Plutella maculipennis</i> (Curt.)	<i>Bixa orellana</i> <i>Brassica oleracea</i> bot- rytis	January to March
<i>Sibine apicalis</i> Dyar	<i>Coffea arabica</i> <i>Hibiscus rosa-sinensis</i> <i>Musa sapientum</i>	January August September
<i>Sibine opheliens</i> Dyar San Pedro	<i>Coffea arabica</i>	March
<i>Stenoma sororia</i> (Zell.) Sarchi	<i>Cinnamomum camphora</i>	August Causes serious in- jury by eating November December seed in pods. Seen ovipositing on pods August 5.
<i>Utetheisa ornatrix</i> (L.) Paso Ancho San Pedro	<i>Crotalaria spectabilis</i> <i>Crotalaria striata</i>	



## ORTHOPTERA

Insect and locality	Collected on	Date and notes
Chiriquia serrata Morse Waldeck	Theobroma cacao	April A grasshopper
Chorisoneura gemmicula Hebard Waldeck	Theobroma cacao	April A roach July
Cocconotus rarus Rehn Paso Ancho Tres Rios	Annona cherimola Antigonon leptopus Canarium odoratum Citrus limonia Cupressus benthami Dracaena fragrans Erythrina rubrinervia	A grasshopper Eating lace curtains  Serious injury to grapes, roses, etc.
Conocephalus cinereus Thunb. Guadalupe Juan Vinas Paso Ancho	Amygdalus persica Annona cherimola Asparagus officinalis Beta vulgaris crassa Chamaedora bifurcata	February April August September
Ellipes minuta (Scudd.)	Beta vulgaris crassa Brassica oleracea capitata Chrysophyllum cainito Crotalaria spectabilis Cupressus benthami Daucus carota	August
Eriolus longipennis Redt. San Pedro	Citrus sinensis Grevillea robusta Persea americana	November Causes injury December to trees by January oviposition
Eumastax silvicola R. & R. Waldeck	Theobroma cacao	April A grasshopper July

Insect and locality	C o l l e c t e d o n	Date and notes
<i>Euphyllodromia angustata</i> (Fabr.) Waldeck	Theobroma cacao	April
<i>Holocomnusa anteca</i> Sauss. San Pedro Waldeck	Gramineae (grass) Theobroma cacao	April A roach October
<i>Insara intermedia</i> (Brum.) Pasó Anchó San José Tres Rios	<i>Ageratum conyzoides</i> <i>Brassica oleracea</i> capitata Chayotea edulis <i>Citrus limonia</i> <i>Coffea arabica</i> <i>Colix lacryma-jobi</i> <i>Coleus blumei</i> <i>Cucurbita pepo</i> <i>Eschscholtzia californica</i> <i>Gomphrena globosa</i> <i>Heliotropium peruvianum</i>	October October 14 November eggs and adults Serious damage to chayote and geranium
<i>Neoribea bracteata</i> (Des.)	<i>Annona cherimola</i> <i>Conoclinium odoratum</i> <i>Crotalaria juncea</i> <i>Croton gossypifolium</i> <i>Datura candida</i>	May August November December
<i>Paraclorea cubensis</i> Sauc.	<i>Mangifera indica</i>	December
	<i>Hymenaea courbaril</i> <i>Ligustrum japonicum</i> <i>Myrsotis sylvatica</i> <i>Pellargonium zonale</i> <i>Prunus armeniaca</i> <i>Radicula arnica</i> <i>Rosa</i> sp. <i>Vernonia brachiata</i>	
	<i>Hedycium coronarium</i> <i>Tabebuia guyacana</i> <i>Tabebuia pentaphylla</i> <i>Terminalia catappa</i>	

Insect and locality	Collected or	Date and notes
Paratettix mexicanus abortus Hancock	Artemisia absinthium Beta vulgaris Coreopsis lanceolata Cucurbita ficifolia Dahlia rosea Daucus carota	Oryza sativa Phaseolus vulgaris Poinsettia pulcherrima Radicula amoracia Saccharum officinarum Solanum tuberosum
Rhipipteryx biolleyi Sauss. Tres Rios	Brassica oleracea capitata Calyptanthus costaricensis Coix lacryma-jobi Daucus carota Fragaria chiloensis Hibiscus rosa-sinensis	Lactuca sativa Phaseolus vulgaris Raphanus sativus Solanum tuberosum Trifolium fragiferum
Schistocerca impleta Wlk. San Jose San Rafael	Amaranthus spinosus Asparagus officinalis Bauhinia purpurea Bidens pilosa Byrsonima crassifolia Citrus paradisi Crotalaria spectabilis Datura candida Dombeya wallichii Dracaena spp. Galinzoga hispida Gerbera jamesoni Grevillea robusta Indigofera suffruticosa	Ligustrum japonicum Lucuma mammosa Lycopersicum esculentum Panicum barbinode Persea americana Poinsettia pulcherrima Sida rhombifolia Taetsia fruticosa Tripsacum latifolia Zea mays



Insect and locality	C o l l e c t e d o n	Date and notes
Stilpnoclorea azteca (Sauss.) San Pedro	Amygdalus persica Citrus sinensis Coffea arabica Bombaya wallichi Fortunella japonica Ligustrum japonicum	February March August September November December
Taeniopoda varipennis Rehn San Jose	Chryso. edulis Coix lacryma-jobi Ipomoea tillicia Neurolepis sp.	July to October December

# I S O P T E R A

Nesutermes costalis Holmg. Woldeck	Theobroma cacao	July
---------------------------------------	-----------------	------

# D E R M A P T E R A

Metromerus ruficeps Scdd. Carriacabat San Pedro	Citrus sinensis Daucus carota	January Eating correts November in a pantry. Eating bark from base of orange tree.
---	----------------------------------	--

# T H Y S A N O P T E R A

Liostrips zetekii Hood San Jose	Persea americana	November to May August A serious pest
Selenotrips rubroclavatus (Giard) Sant. Rosa	Theobroma cacao	July



# INSECT PEST SURVEY BULLETIN

Vol. 16

Supplement to No. 9

December 20, 1936

## COLONIZATION OF PARASITES OF THE EUROPEAN CORN BORER IN THE UNITED STATES in 1936

By W. G. Bradley<sup>1/</sup> Assistant Entomologist  
and E. W. Beck, Junior Entomologist  
Division of Cereal and Forage Insect Investigations  
Bureau of Entomology and Plant Quarantine  
U. S. Department of Agriculture

The activities in connection with the biological control of the corn borer as discussed in this report were directed from the laboratory for European corn borer research at Toledo, Ohio.

The objectives of the program of 1936 were (1) the dispersion of Inareolata punctoria Roman, an ichneumonid attacking third-instar corn borer larvae and indigenous both to Europe and the Orient, over as much as possible of the infested territory not previously colonized by this species; and (2) the testing in the more southern range of the borer of two species of parasites, viz, Cremastus flaveo-orbitalis (Cameron), an ichneumonid of oriental origin attacking fourth-instar larvae, and Microgaster tibialis Nees, a braconid attacking second-instar larvae and indigenous to Europe and the Orient. Previous releases of these two species had resulted in initial establishment but not maintenance.

Parasite material.-- For the first time since the inauguration of the biological control program in 1920, it was deemed feasible to depend upon procuring a supply of the parasites most desired for dispersion purposes, from areas where corn borer parasites were first released in the United States. From these areas, some 14,000 adults of I. punctoria were obtained, thereby permitting an appreciable extension of the total area colonized with this species. Incidental to this work, adults of Lydiella stasulans var. grisea R. Deev. were obtained and were used for colonization in more or less isolated infested areas. A supply of M. tibialis was made available through the Division of Foreign Parasite Introduction. The Entomological Branch of the Canadian Department of Agriculture provided a supply of C. flaveo-orbitalis from

<sup>1/</sup>D. W. Jones, C. A. Clark, E. D. Burgess, M. J. Morney, and J. S. Mayfield assisted in the release of parasites in the regions of their respective assignments.



the Orient, and a supply of Chelonus annulipes Wesm. bred in the laboratory at Bellville, Ontario. The last-mentioned species was shipped from Canada direct to the point of liberation, but all other material was handled at the Moorestown, N. J., laboratory and shipments were made from that point for distribution. The total releases of corn borer parasites made during 1936 in the United States are summarized by States in table 1. The total releases to December 31, 1936, are given in table 2. The method of selecting colony sites, technique in making releases, colony sizes, etc., were essentially the same in 1936 as in previous years. Information regarding the species released in 1936 follows.

I. punctoria (Ichneumonidae).-- As shown in map 1, a considerable portion of the area infested by the borer was colonized by this species in 1935. Since further extension of this area was the chief objective of the 1936 program, major emphasis was placed on the handling of the host larvae to insure its distribution to field localities under conditions optimum for its establishment, particularly as regards synchronization with the appearance in the field of the preferred stage of its host. The extent of additional distribution of Inareolata during the season is shown on map 1. A total of 14,271 adults were released in 25 colonies. Three of these were at test-colony sites in New Jersey and Virginia, thereby providing an opportunity for observation on the reaction of this species to new environments. Table 3 summarizes the releases of this species in 1936. In most instances satisfactory synchronization of releases of this species with its preferred host stage was achieved. The first adults to emerge from material manipulated to supply adults for the multiple-generation area were released in localities of most advanced borer development and the adults that appeared later were used for colonies located farther north. Under actual conditions experienced during the current season it is probable that a slightly more advanced emergence period would have been desirable. In the one-generation area synchronization of releases with the presence of preferred host stages, as determined by observation at various field stations, was accomplished satisfactorily.

M. tibialis (Braconidae).-- It was desired to test this species in areas characterized by environmental conditions that might be more favorable to its successful establishment than those encountered at points of previous release. Synchronization of releases with the presence of the parasite's preferred host stage (second-instar larvae) was accomplished at all localities. This may be effected with Microgaster by manipulating the cocoons, in which stage the material hibernates and is imported. Observations of host development during the current season indicate when the optimum period will prevail for releases. The cocoons are removed from storage and placed in a developmental environment at the proper time to induce adults to emerge to conform to the host requirements at the various proposed localities of release. Table 4 summarizes the releases of this species.

M. stabulans var. griseus (Tachinidae).-- A supply of this tachinid, derived both from domestic sources and the Orient, was released at two dispersion points. One colony of 1,935 individuals from the Orient was liberated in Miles Township, Centre County, Pa., on July 10. The second colony was released in Newark Township, Worcester County, Md. This colony, consisting of 5,365 adults from the domestic source, was released in two lots, one of 1,534 on June 2, and one of 3,731 on July 3. Two small lots of domestic adults (one of 215

and one of 525) were released in Woodland Township, Burlington County, N. J., on June 17 and July 18, respectively, supplementing the 1935 releases in that locality.

C. annulipes (Braconidae).--- Through cooperation with the Entomological Branch of the Canadian Department of Agriculture it was possible to release three lots of this species at one colony site in Lee Township, Accomac County, Va. These releases consisted of individuals bred in the laboratory at Belleville, Ontario, and were made on July 31, August 7, and August 19. A total of 2,105 adults were released in lots of 873, 1,008, and 224, respectively, on the above dates. It is known that host eggs, the stage utilized by this species for oviposition, were present in the field during the period of release.

Conclusions.--- Except in Virginia and western and central Ohio, where the weather was abnormally hot and dry, the season in general appeared favorable to the successful colonization of corn borer parasites. The completion of the current season's colonization activities has demonstrated that Inareolata punctoria, one of the most promising of the imported parasites of the corn borer, may be obtained in satisfactory numbers more economically from well-established colony sites in the United States than from foreign sources.

Table 1.--Summary of releases of imported parasites in 1936

State	C. annulipes	L. griseus	I. punctoria	C. flavocorbitalis	M. tibialis	Total
	Number	Number	Number	Number	Number	Number
Connecticut..	--	--	--	--	1,394	1,394
Indiana.....	--	--	599	--	--	599
Maryland.....	--	5,365	--	--	--	5,365
Massachusetts	--	--	1,679	--	--	1,679
Michigan.....	--	--	1,679	--	--	1,679
New Jersey...	--	810	585	599	1,809	3,803
New York.....	--	--	1,779	--	--	1,779
Ohio.....	--	--	6,835	--	--	6,835
Pennsylvania..	--	1,965	--	--	--	1,965
Virginia.....	2,105	--	1,188	2,371	3,100	8,668
Total..	2,105	8,140	14,271	2,970	7,000	34,486

Table 2.--Total releases of imported reptiles in the United States to December 31, 1935

State	Agkrotodes sp.	Agkrotodes thompsoni Tyler	Brecon atricornis (Smith)*	Campoplex multilectus Grav.	Campoplex pyraustae Smith	Chelonus annulipes	Oreosaurus flavocinctus	Eulimneria alba Ell. & Sacht.*	Eulophus viridulus Thoms.	Exeristes roborator Fab.	Inareolata**	Lybelle strabalis var. triscens
Conn..	--	21,268	12	--	--	2,227	1,483	1,057	17,200	--	5,882	32,735
Ill...	--	--	--	--	--	--	--	--	--	2,302	--	--
Ind...	--	5,700	--	--	--	2,259	--	5,161	5,671	22,505	5,568	25,555
Maine.	--	--	--	--	--	--	--	--	--	--	--	1,927
Md....	--	--	--	--	--	--	--	--	--	--	--	5,365
Mass..	300	59,144	127	1,129	1,597	9,204	5,762	28,526	84,786	54,957	30,363	92,067
Mich..	--	34,837	--	--	--	5,363	--	24,075	44,037	56,607	8,764	123,584
N. H..	--	--	--	--	--	--	--	--	--	--	--	5,509
N. J..	--	--	--	--	--	--	1,192	--	--	--	1,150	7,071
N. Y..	3	51,106	--	61	16	4,733	1,109	9,279	55,755	40,050	15,545	122,153
Ohio..	--	52,505	--	357	38	19,157	5,145	36,398	101,648	87,826	42,991	219,820
Pa....	--	5,774	--	--	--	--	--	550	--	20,119	707	11,588
R. I..	--	11,756	211	123	47	7,552	1,014	4,636	7,446	--	14,572	55,293
Vt....	--	--	--	--	--	--	--	--	--	--	--	9,813
Va....	--	--	--	--	--	2,105	2,971	--	--	--	1,168	3,956
Total.	391	250,900	350	1,670	1,798	53,660	19,676	109,682	317,543	314,766	129,750	696,437

\* European and oriental material

\*\* European, oriental, and domestic material



Table 2 (con't).--- Total releases of imported parasites in the United States to December 31, 1936

State	Macrocera ciliata*	Metopius naticollis	Microgaster brevicornis	Microgaster tibialis*	Memorilla floralis	Phaenogenes nigritarsis	Phaenogenes erecta	Zenillia nitida	Zenillia roseanae	Total
Conn...	8,036	--	--	7,101	533	1,620	193	178	7,754	102,280
Ill...	--	--	3,035	--	--	--	--	--	--	5,937
Ind...	4,416	--	107,109	8,985	--	--	--	8	8,526	203,663
Maine...	--	--	--	--	--	--	--	--	--	1,927
Mass...	--	--	--	--	--	--	--	--	--	5,355
Mich...	70,221	--	1,084,540	84,839	371	21,885	--	514	64,802	1,705,642
Minn...	40,780	--	534,334	81,747	--	3,933	--	395	17,896	1,007,302
N. H...	--	--	--	--	--	--	--	--	--	5,559
N. J...	--	--	--	1,809	--	--	--	--	--	11,422
N. Y...	37,057	--	349,294	34,752	--	569	4	403	29,743	752,742
Ohio...	132,241	--	587,583	138,585	843	8,305	499	1,064	32,534	1,417,950
Pa...	9,006	--	128,211	6,842	--	347	--	20	3,000	127,914
R. I...	33,214	8	--	19,740	--	12,037	--	188	9,305	157,142
Vt...	--	--	--	--	--	--	--	--	--	9,813
Va...	--	--	--	3,199	--	--	--	--	--	13,419
Total...	335,381	8	2,794,755	387,449	1,747	48,627	696	3,430	174,160	5,644,137

\* Includes adults from European and oriental sources

Table 3.-- Summary of Inareolata punctoria releases in 1936

State	Township	County	Parasites liberated	Period of release (dates inclusive)
			<u>Number</u>	
Indiana .....	Lafayette	Allen	599	July 21
Massachusetts...	Agawam	Hampden	522	July 8
	Charlton	Worcester	597	July 6
	Hadley	Hampshire	560	July 14
Total .....	--	--	1,679	July 6 - 14
Michigan.....	Harrison	Macomb	599	July 25
	Hoylton	Tuscola	598	July 28
	Lexington	Sanilac	409	Aug. 6
Total.....	--	--	1,606	July 25 - Aug. 6
New Jersey.....	Atlantic*	Monmouth	585	July 2
New York.....	Hamlin	Monroe	588	July 21
	Ontario	Wayne	598	July 21
	Scriba	Oswego	593	July 21
Total.....	--	--	1,779	July 21
Ohio.....	Avon	Lorain	525	July 14
	Brown	Darke	578	July 16
	Claiborne	Union	565	July 17
	Liberty	Delaware	581	July 17
	Liberty	Hardin	586	July 23
	Newberry	Miami	598	July 23
	Richland	Logan	588	July 29
	Salem	Champaign	542	July 23
	Scott	Marion	514	July 17
	Shawnee	Allen	587	July 16
	Washington	Auglaize	593	July 16
	Washington	Defiance	578	July 21
Total.....	--	--	6,835	July 14 - 29
Virginia.....	Lee*	Accomac	595	July 1
	Franktown*	Northampton	593	July 1
Total.....	--	--	1,188	July 1
Grand total.	--	--	14,271	July 1 - Aug. 6

\* Test colonies.

Table 4.--Summary of *Microgaster tibialis* releases in 1936

State	Township	County	Parasites liberated	Period of release (Dates inclusive)
			<u>Number</u>	
Connecticut...	E. Hartford	Hartford	1,394	June 22
New Jersey...	Atlantic	Monmouth	1,809	June 23
Virginia ....	Lee	Accomac	2,093	June 4
	Franktown	Northampton	1,106	June 6
Total ....	--	--	3,199	June 4-6
Grand total.	--	--	7,002	June 4-23

*C. flavoorbitalis* (Ichneumonidae).-- In order to test this species further in areas having winters less rigorous than those characteristic of colony sites where parasites have failed to become established, colonies were released in Virginia and New Jersey. Table 5 presents the data in regard to releases of this species.

Table 5.--Summary of *Cremastus flavoorbitalis* releases in 1936

State	Township	County	Parasites liberated	Period of release (Dates inclusive)
			<u>Number</u>	
New Jersey...	Berkeley	Ocean	599	July 8
Virginia.....	Lee	Accomac	1,191	July 8-11
	Franktown	Northampton	1,180	July 8-13
Total....	--	--	2,371	July 8-13
Grand total.	--	--	2,970	July 8-13

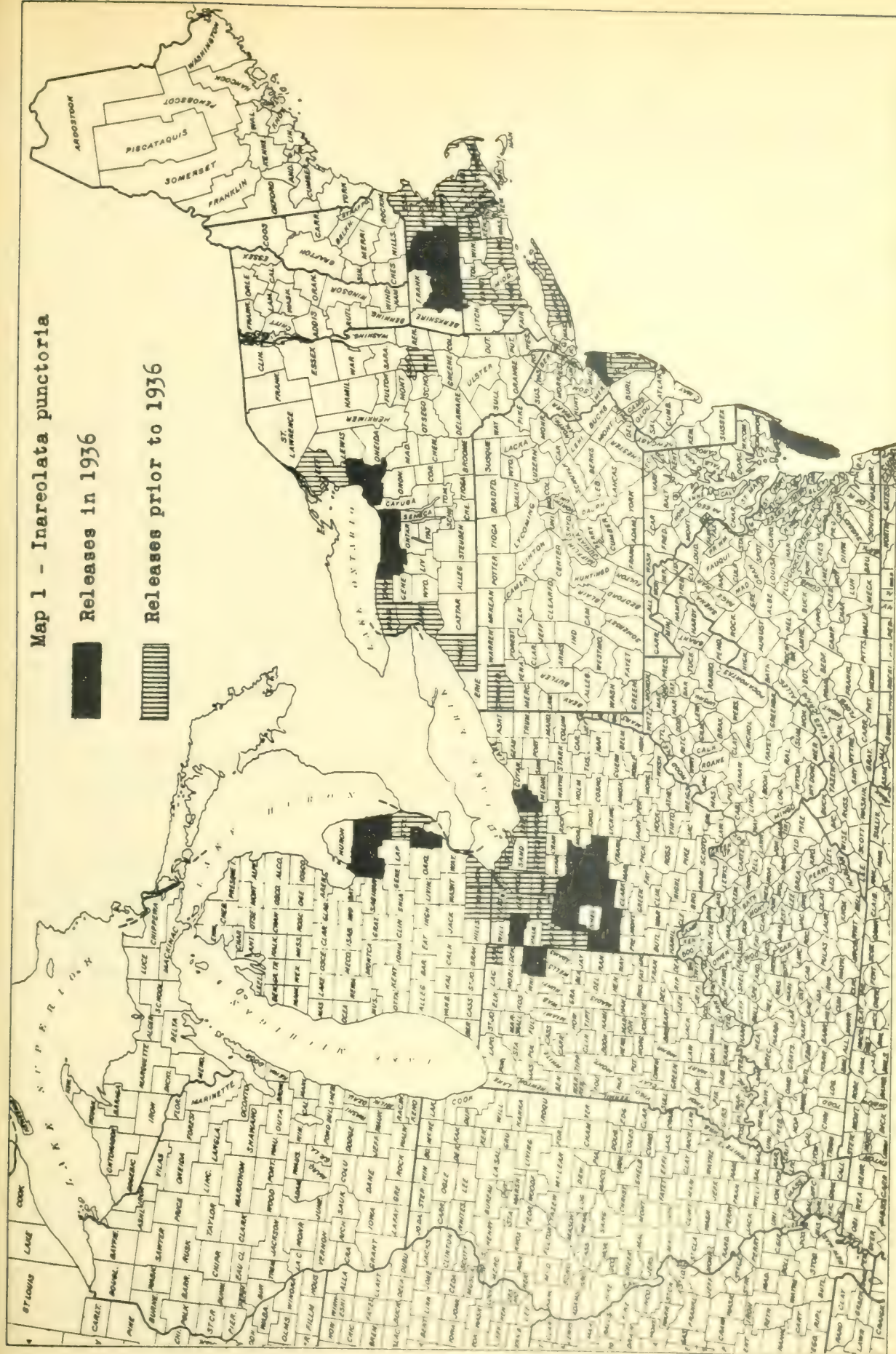
Available information indicates that the release in New Jersey coincided nicely with the presence of the parasite's preferred host stage. The exact extent of synchronization in Virginia is not known, although some individuals of the preferred host stage were present.





## Releases in 1936

Releases prior to 1936







## INTRODUCTION

An excellent opportunity for the study of the effect of weather on the abundance and distribution of insects was afforded by the year 1936, as the entire year was characterized by extremes in climatic conditions. The winter was abnormally cold over the entire United States, except in the southern Rocky Mountain and Great Basin States, and a narrow strip on the coast in the Northwest. Snowfall was the heaviest in many years in the region north of the Potomac, the Ohio, and the Missouri Rivers. The summer was unprecedentedly dry and hot from the Rocky Mountains to the Appalachians and abnormally dry in the Eastern States.

The break in the severe winter weather came the latter part of February and, following this, temperatures were almost continuously above normal for the month of March, except in the Western and Northwestern States, where abnormally cold weather prevailed the last week of the month.

The month of April was cooler than normal over nearly all sections of the country east of the Rocky Mountains and warmer than normal generally west of the Rockies.

The temperature for May was above normal in practically all parts of the country. Precipitation varied greatly in different areas, ranging from much above normal to markedly deficient, the latter predominating. The Southwest had heavy rains, the northern Plains States were dry, and from the Mississippi Valley eastward the month was one of the driest Mays of record.

The very dry weather started in June, when the entire country east of the Rocky Mountains, except Florida, had deficient rainfall. During the summer the country lying between the Rocky Mountains and the Appalachians experienced unprecedently hot, dry weather, rainfall over large areas being less than half of normal. There was some lack of rain in the Eastern States. In the States west of the Rocky Mountains rainfall was above normal.

August brought rain to the Northeastern States, the Lake region, the Upper Mississippi and Ohio Valleys, small isolated areas in the Gulf and South Atlantic States, parts of Colorado, and much of the Great Basin and plateau regions; but over more than half of the country, embracing the heart of the agricultural region, the rainfall was markedly deficient. In September rainfall was above normal over most sections east of the Rocky Mountains, except the northern Plains States, bringing to a close one of the most disastrous droughts in the history of the United States.

A comparison of the weather with insect conditions represented in reports received by the Insect Pest Survey, brings out some interesting correlations. Observations made from the reports on a few insects are cited, to illustrate the possibilities of the use that might be made of extensive and complete reports on the distribution of insects.

A high winter mortality was reported for several species of insects, and especially those species that have pushed their range northward during the last few years of mild winter weather. The winter of 1934-35 was abnormally cold only in the northeastern part of the country.

The San Jose scale was reported as having been almost completely wiped out above the snow line in areas in the East Central States, where in recent years it has been reported as increasingly destructive, as well as advancing northward in its range. In 1933 the scale was reported in some abundance in areas in the Northeastern States. In the Spring of 1934 high winter killing was reported, although reports of injury followed during the summer. In 1935 very few reports were received from that region, and in 1936 only two reports were received from northeast of the Potomac River. On the other hand, the European elm scale, a northern species, evidently experienced no abnormal winter mortality.

The tobacco flea beetle, which has been reported as very destructive in the tobacco-growing section of Kentucky and Tennessee during the last few years, was not reported from that section in 1936. It was reported, however, from North Carolina. Other flea beetles were reported in at least normal abundance from most parts of the Eastern States.

Soil samples taken from fields in New Jersey, where sweet corn was heavily infested by the corn ear worm in 1935, were examined in October 1935 and found to contain living pupae. Similar soil samples were examined in April 1936, and no living pupae were found. A few reports of high winter mortality of this insect were received from other States. This fact, with almost no reports of injury by the larvae early in the summer, indicates low winter survival. Reports late in the summer and fall indicate that the insect had built up destructive populations.

The hessian fly suffered high winter mortality, which, coupled with unfavorable weather in the Spring of 1936, checked the impending outbreak.

The harlequin bug, a southern species, advances northward in years of mild weather. The last few years have been favorable and, beginning about 1932, reports indicate its occurrence in destructive abundance north to a line from Central Ohio westward to southern Iowa. During the season of 1936, it was not reported north of 35° north latitude, except at Norfolk, Va.; the southern tip of Ohio, in Lawrence County; and in east-central Kansas, in Douglas County.

Extremes in the weather caused fluctuations in codling moth populations. The cold winter killed many of the overwintering larvae in the eastern part of the country, but warm weather in May stimulated activity, affording the species an early start, and it staged a very rapid comeback in most central and eastern localities, although reduced during the summer by the dry hot weather in a few west-central States.



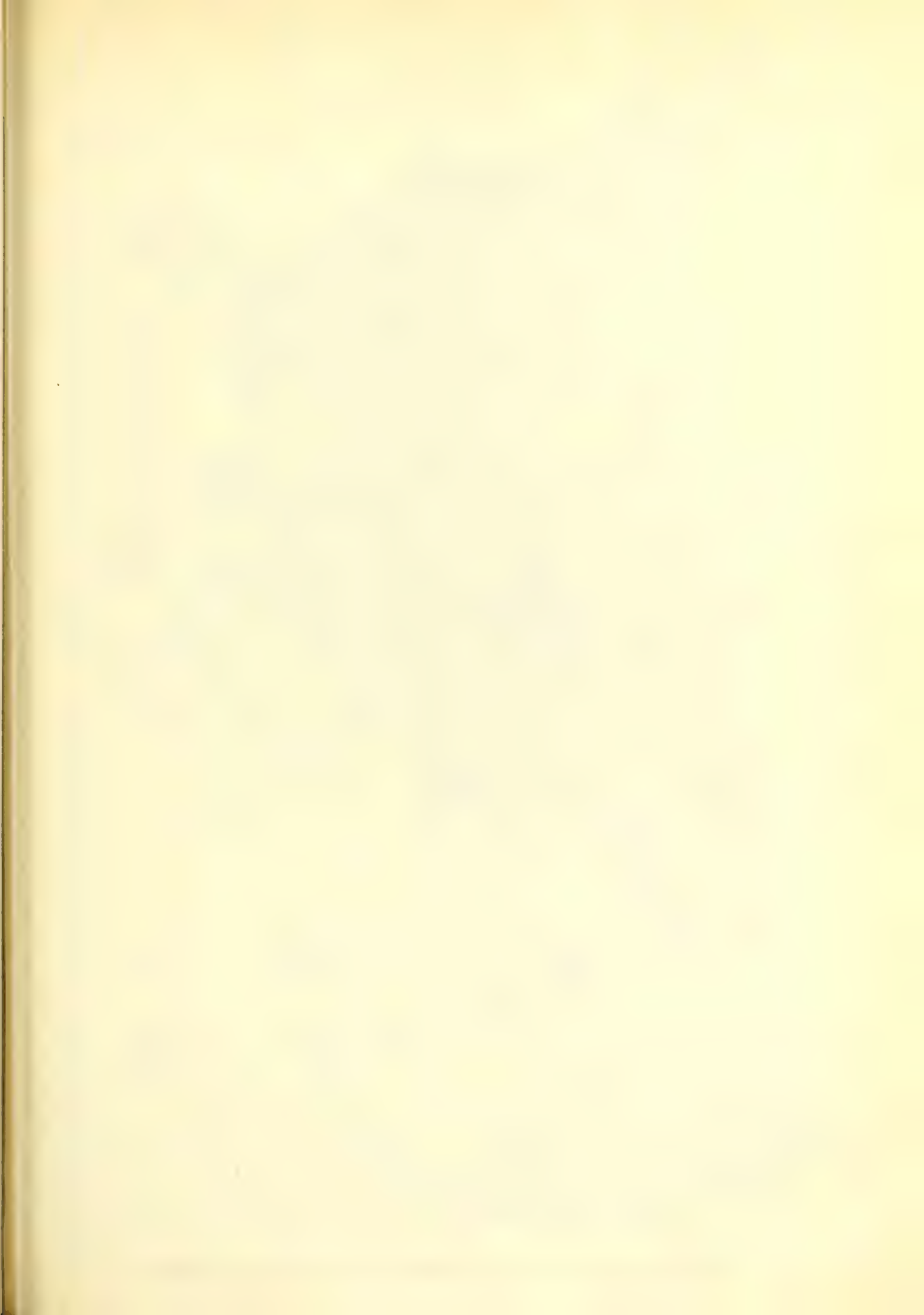
As a result of the high winter mortality of the boll weevil, combined with the effect of the drought, this insect was less abundant than at any time since its establishment throughout the Cotton Belt, except in Texas.

Unseasonably cold weather in Florida in February 1936 prevented the blooming of wild plants, resulting in a scarcity of thrips. It also prevented tender growth of citrus on which the citrus aphid feeds, thereby causing a scarcity of this insect.

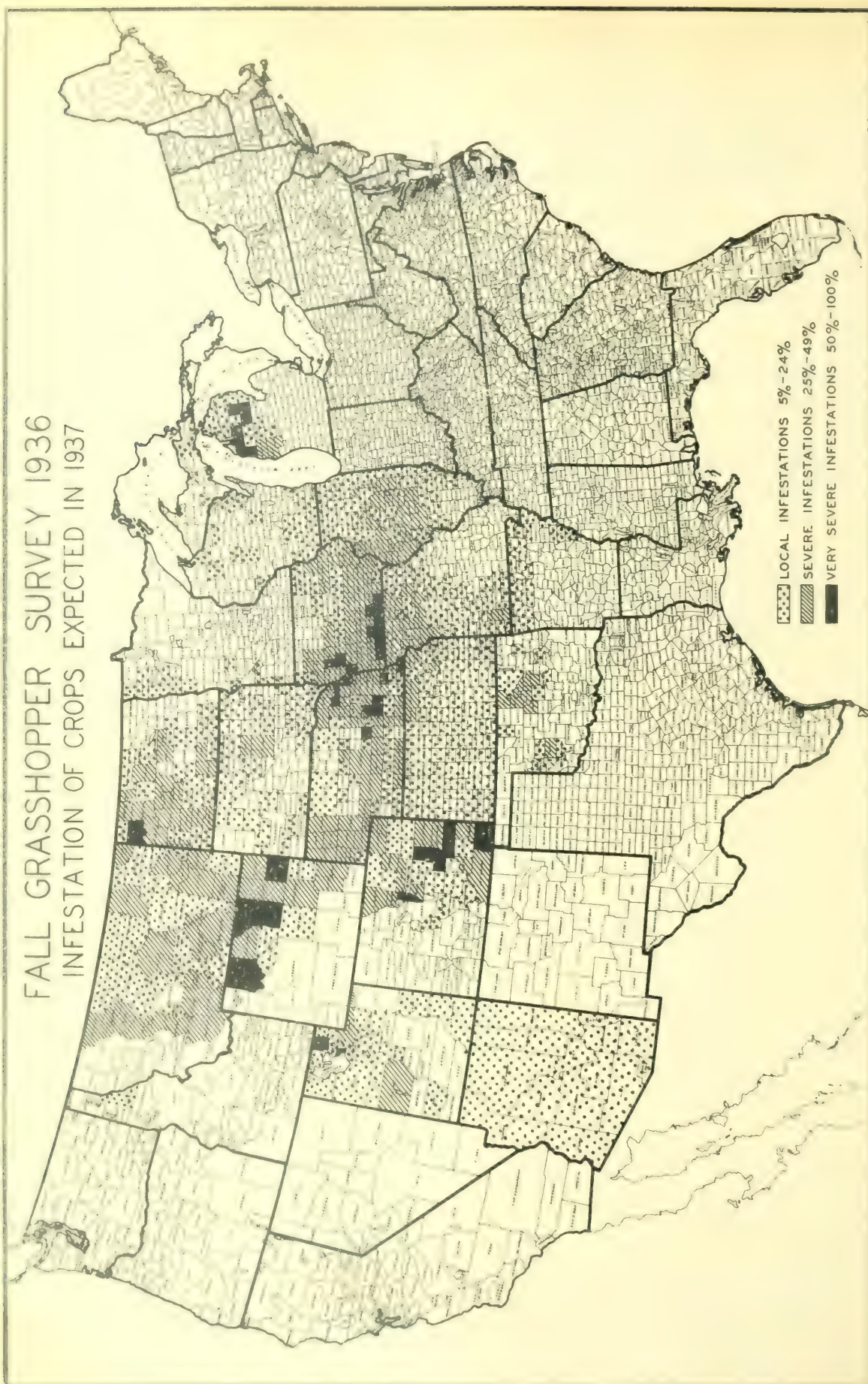
The drought had a deleterious effect on the chinch bug by drying up its food plants in the western part of its range.

Other insects affected by the weather include the grubs of the japanese beetle, which were killed by the cold, as were also the eggs of the gypsy moth, and the Mexican bean beetle and grasshoppers, which were repressed by the heat.

The effects of the unusual weather of the year will probably be reflected in insect conditions during the coming year, and reports on all observations made over the country will help to build up evidence from which to draw additional conclusions on the effect of weather on insect pests.



FALL GRASSHOPPER SURVEY 1936  
INFESTATION OF CROPS EXPECTED IN 1937





## INSECT PESTS

### GRASSHOPPERS

During the summer of 1936 grasshoppers extended their previous zone of severe infestation in the Northern Great Plains and Upper Mississippi Valley and pushed southward to Arkansas, Oklahoma, and Texas. Extensive crop damage took place in Illinois, Iowa, Kansas, Missouri, Montana, Nebraska, Oklahoma, and Wyoming. The value of crops destroyed in these States has been estimated at approximately \$80,000,000. Less extensive crop damage occurred in Arkansas, California, Colorado, Minnesota, Michigan, North Dakota, Oregon, South Dakota, Texas, Utah, and Wisconsin. In addition to losses in cultivated crops, the hoppers severely injured range grass and pastures in Montana, Nebraska, North Dakota, South Dakota, Utah, and Wyoming.

After the coldest winter on record (the mean monthly temperature for North Dakota for February 1936 was  $-14^{\circ}\text{F.}$ ), the weather over the grasshopper-infested area suddenly broke hot and dry about May 1, and continued on into the hottest and driest summer on record. Daily maximum temperatures of above  $100^{\circ}$  occurred in many parts of the territory during about 17 days in June, 25 days in July, 25 days in August, and even a day or so during the first week of September. Maximum air temperatures broke all-time records from  $118^{\circ}$  to  $121^{\circ}$ . Some areas went without a drop of moisture for over 100 consecutive days.

Hatching was first recorded on April 20 at Huntley, Mont. In other parts of the area -- the Dakotas, Iowa, Nebraska, Michigan, Wisconsin, Kansas, and Colorado -- first hatching occurred from May 1 to May 18. Because of the hot, dry weather, the nymphs developed rapidly and depredations started early. Adults of Melanoplus bivittatus Say and M. mexicanus Sauss. were taken early in June in Iowa and Montana, most individuals becoming adult by June 15. On the other hand, in Oklahoma most of the M. bivittatus and M. differentialis Thos. did not reach the adult stage until after July 1. Active control measures to protect crops were necessary in the Yellowstone Valley, Mont., by the first week of May and in other States by the 15th. May rains in Iowa, Nebraska, Kansas, and Oklahoma held the hoppers in check and allowed most of the small grain to escape their ravages.

Nymphs first appeared in the alfalfa, grain, and pasture lands. When these were cut or when they had dried up, the hoppers moved into the corn and other late crops. This general movement took place the last week of June. As the intense heat continued in July, the next move was to take to the trees, shrubs, fence posts, telephone and telegraph poles, and, where there were no trees, to tall weeds. The only available moisture was in the bark and leaves of the trees and shrubs, which the roosting hoppers barked and defoliated. In parts of Kansas, Nebraska, and Oklahoma the Osage-orange is used for hedge fences, and these were stripped bare. Many orchards suffered. Along water courses

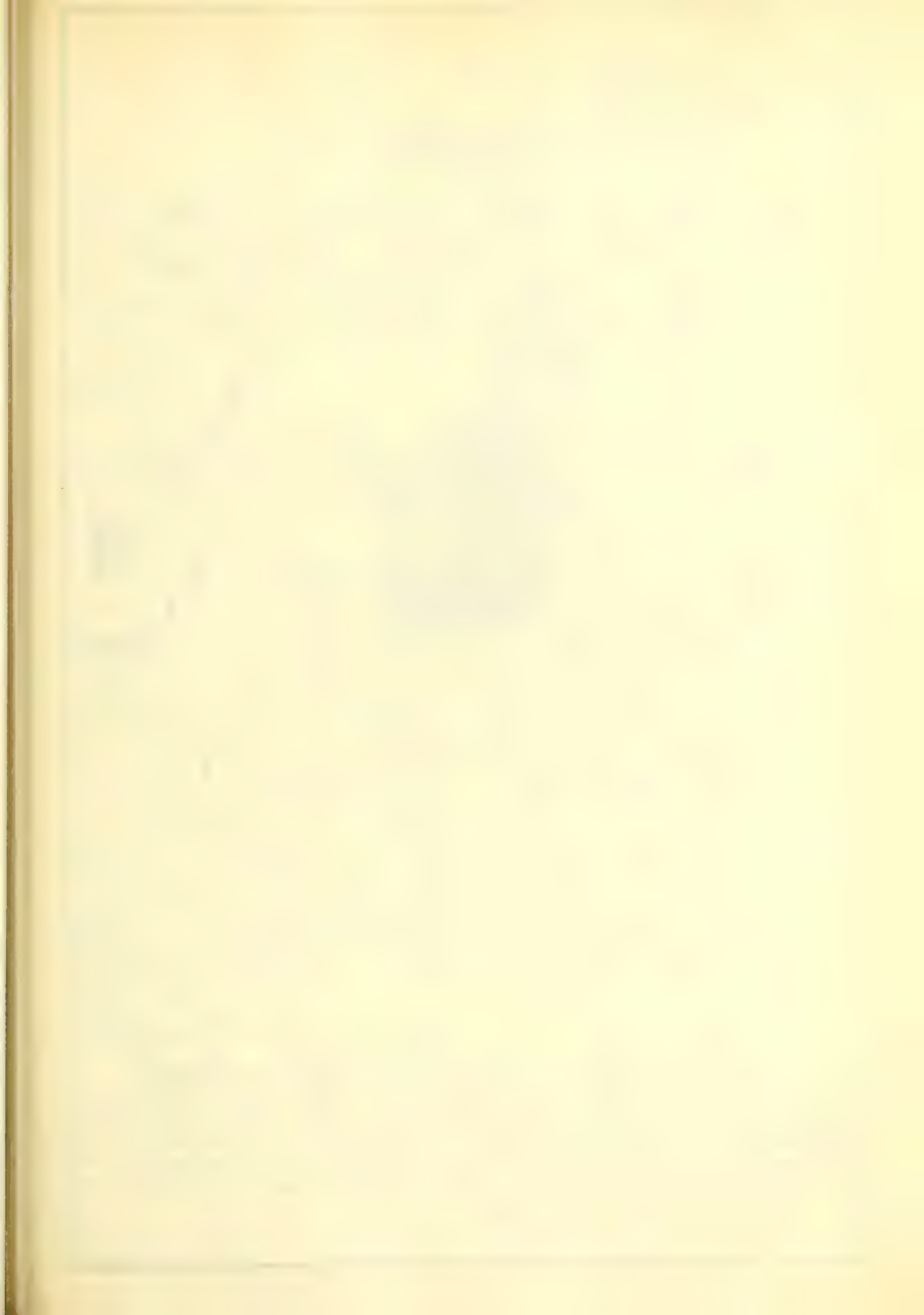
in groves and shelterbelts, the willows, poplars, mulberries, and even elms and other trees were defoliated. Fields of 12-foot corn were made to look like forests of fishing poles. In Oklahoma one-tenth of the cotton crop was damaged by July 1.

Careful observations have shown that the optimum air temperatures for activity on the ground are between 75° and 85° F. with surface-soil temperatures under 113°. Above these temperatures the hoppers either take to the air or roost in the shade as high off the ground as possible. With air temperatures this past summer remaining above 90° for the greater part of the day and for day after day, it is no wonder that the pests took to the trees and did such spectacular damage.

Over the whole area, oviposition was quite erratic. In northwestern Iowa, Melanoplus bivittatus had completed its life cycle and laid its eggs by August 10. M. mexicanus laid its eggs early enough over a large part of the area to produce a partial second generation. In eastern Nebraska and western Iowa this second generation hatched about the last week of August. This same phenomena was observed last year in a number of places, but seemed more general this year. In Oklahoma, M. differentialis was still congregated in the trees, shrubs, and tall weeds on September 18, when few eggs had been deposited. Where rains had occurred 2 weeks before this date, egg-laying was well started. In a large part of this area the first moisture for all summer came in a general downpour on September 15-18. In these dry areas no egg deposition took place and no well-developed eggs were found in the females before the fall rains began. On the uplands of Kansas, egg deposition by M. differentialis began about October 19. At this time along the Missouri River bottom in eastern Nebraska and western Iowa, where green food was more abundant, oviposition by this species was completed.



The heat and drought, no doubt, destroyed many of the adults. Observers report that the hoppers were so inactive during the extreme heat that it was possible to walk up and pick them off the fence posts and shrubs without disturbing them. G. A. Bieberdorf, in Oklahoma, reported a heavy mortality among M. differentialis under such conditions. Workers in other States reported the same thing, these reports being corroborated by farmers and county agents. In these areas it is very probable that many female adults died without depositing eggs.

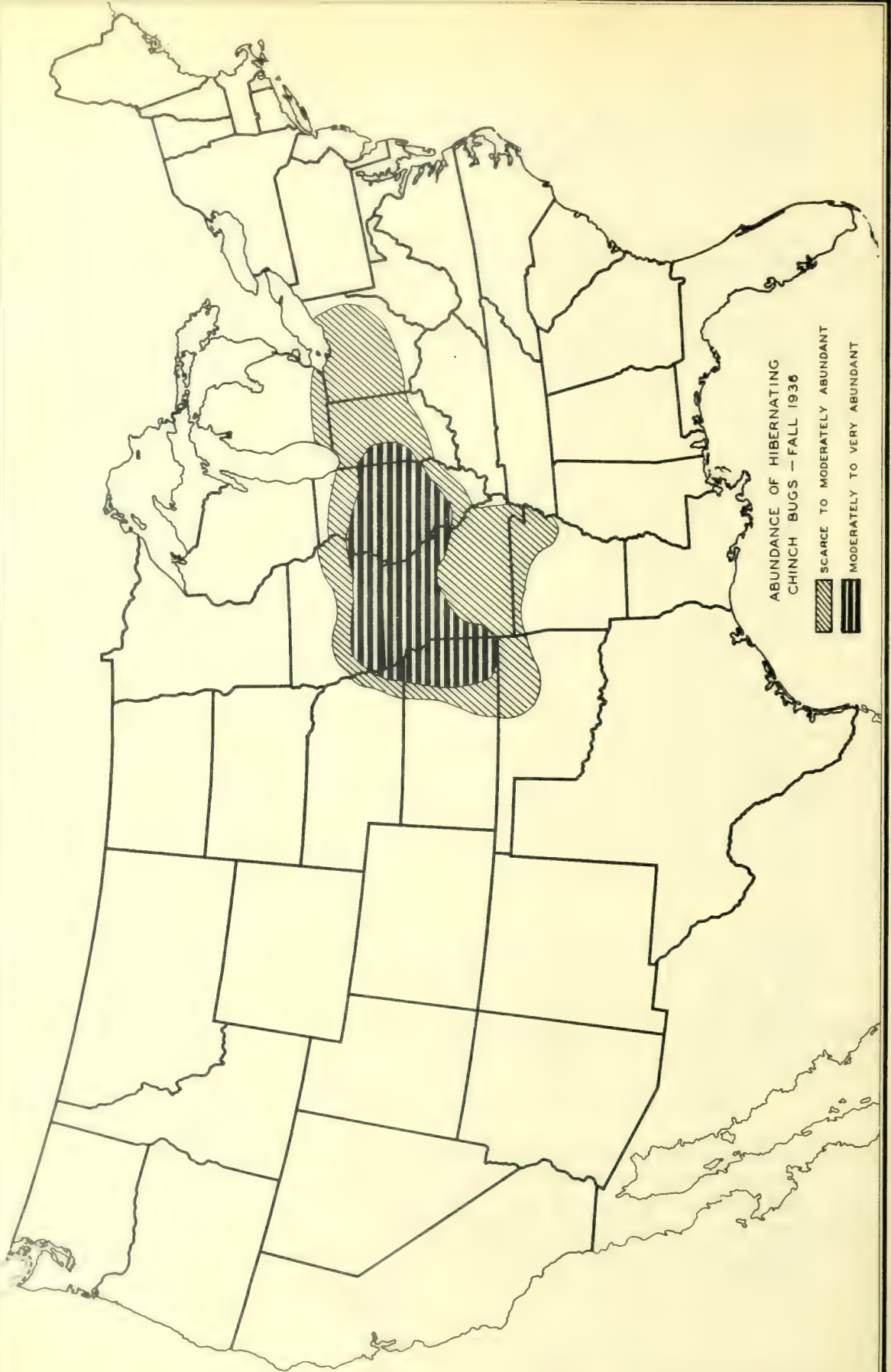
The map for the fall survey for 1936 shows the relative distribution of the infestations expected in 1937. This is based on the combined adult-and-egg survey conducted by the Bureau of Entomology and Plant Quarantine, in cooperation with State agencies. Infestations are most severe in Illinois, Missouri, Iowa, Nebraska, Kansas, North Dakota, Montana, Wyoming, and Colorado, and less severe in Michigan, Wisconsin, South Dakota, and Oklahoma.





ABUNDANCE OF HIBERNATING  
CHINCH BUGS — FALL 1936

	SCARCE TO MODERATELY ABUNDANT
	MODERATELY TO VERY ABUNDANT



Combinations of M. mexicanus, M. bivittatus, M. femur-rubrum Deg., and several range species were dominant in the Northern States. Combinations of these named species plus M. differentialis were the most important hoppers in the Southern States. In Colorado Disso-steira longipennis Thos. was numerous and dominant in a large part of the range land in the southeastern quarter. (J. R. Parker and Robert L. Shotwell, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### EUROPEAN CORN BORER

This insect is treated fully by A. M. Vance of the Bureau of Entomology and Plant Quarantine, in a Supplement to No. 9 of the Insect Pest Bulletin (November 15, 1936).

#### CORN EAR WORM

The first report of the year of the occurrence of this insect was received in January from southeastern Texas. By the third week in March egg laying was observed in the coastal sections of northeastern Texas, and by that time the insect was damaging corn in Louisiana and other Gulf States, as well as in southern California. By the middle of May larvae were observed in Georgia and very heavy infestations in tomatoes were observed in parts of Mississippi and southern California. During the first week in July egg laying was observed in northern Iowa and the insects were severely damaging corn as far north as Kansas, Tennessee, and Kentucky, in the Mississippi Valley, and in Washington, on the Pacific coast. During the spring and summer the insect was generally scarce throughout the country, except for a few areas in Texas where considerable damage was done to cotton; however, in September populations developed rapidly from New England to Iowa and southward to North Carolina and Tennessee. Serious crop damage was quite generally reported throughout this region to tomatoes and late sweet corn. The outbreak on the Pacific coast developed to such an extent that in December 65 percent of the sweet corn was infested in some places in California.

#### CHINCH BUG

Hibernating chinch bugs were present in 1936 in moderate-to-extreme numbers in northern and central Illinois, southern Iowa, the northern half of Missouri, and eastern Kansas. About six counties in southwestern Iowa, and an area of similar size in southeastern Iowa, extending a few miles over into Illinois, contained extremely large numbers of bugs. Infestation was from light to moderate in a



belt of varying width surrounding the more heavily infested area just outlined and extending from south-central Oklahoma, east-central Kansas, and southeastern Nebraska to eastern Ohio, and from north-central Iowa to southern Missouri. Early spring reports indicate only about 50 percent winter survival in Ohio, northern Indiana, northern Illinois, and southern Iowa, but a much higher survival in Missouri and Kansas. In northern Oklahoma winter survival was reported to be only about 21 percent. Spring migration to and establishment in small grains was rather slow in the more northern areas but spring and early summer conditions were, in general, favorable to development of the first brood. Injurious migrations to corn occurred on occasional farms in scattered localities throughout the Corn Belt, from southwestern Michigan to extreme southeastern Nebraska and south into east-central Oklahoma and northern Arkansas. Injury to corn was also reported from the eastern Carolinas and Virginia, southeastern Minnesota, Mississippi, and southern Texas. Summer conditions were also favorable to the development of the second brood in corn in the more eastern part of the affected area, but in Kansas and Oklahoma the prolonged drought reduced infestations materially, along with the drying up of host plants. As a result of the early fall rains and more abundant food, however, the bugs made something of a late-season comeback in the Southwest. Fall conditions were fairly favorable to their activities and preliminary reports indicate that they are generally from moderately to extremely abundant in winter quarters from Western Indiana to southeastern Nebraska and eastern Kansas, and from southern Iowa to central Missouri and the Oklahoma-Kansas line. Scant to moderate numbers are reported from Ohio, eastern Indiana, northern and southern Illinois, south-central Iowa, southern Missouri, northern Arkansas, and northeastern Oklahoma. At the close of the year the situation apparently approaches that prevailing at the end of 1933, with a prospect of another outbreak in 1937. The accompanying map shows the abundance of chinch bugs in hibernation in the fall of 1936. In the central area local injury is likely, and, if spring weather favors the bug, general injury is anticipated. In the surrounding area local injury is likely if the weather favors the bugs. This summary is based principally on information supplied by the State entomologists of the States concerned and on supplementary data from the stations of the Bureau of Entomology and Plant Quarantine in the States. (C. M. Packard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### HESSIAN FLY

The severity of the widespread outbreak of the hessian fly in progress of development in the fall of 1935 was considerably moderated by subsequent weather conditions unfavorable to fly activity. The unusually heavy late fall brood a year ago suffered considerable winter mortality. Unfavorable weather conditions last spring at critical times during the development of the spring brood checked the progress



of the outbreak. Nevertheless, from moderate-to-severe spring infestations developed throughout a rather large area extending from east-central Missouri through central and southern Illinois, widening to include most of western Indiana and narrowing again to continue across southern Indiana into southwestern Ohio. Light-to-moderate infestations also occurred in some localities of southern Michigan, east-central Ohio, and north-central Pennsylvania. The most severely infested area included southern Illinois, southern Indiana, and southwestern Ohio. In this area most of the fields observed were injured to some extent and much fallen straw was in evidence. A conservative estimate of damage to the 1936 crop places the loss in Illinois, Indiana, and Ohio at 6,878,000 bushels, or about 6 percent of the crop, with a value of \$6,521,000 at current prices. At harvest time a severe fall outbreak extending from eastern Missouri to southwestern Ohio threatened, with practically no danger of such an occurrence in the west-central, southern, or eastern States, except for restricted areas in southern Michigan, eastern Ohio, and central Pennsylvania. However, the summer drought caused unusually high mortality of aestivating puparia, and fall weather conditions were rather unfavorable to fly activity or early sowing of wheat. Moderate fall infestations are present in volunteer and in occasional early sown fields in some localities throughout the Central States but reports from most of these States indicate that generally wheat was sown late and fly infestations are in general very light, with little prospect of material injury to the crop next spring, except in occasional fields. This summary is based on observations and surveys by the Bureau of Entomology and Plant Quarantine and the entomologists of the States concerned. (C. M. Packard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### BLACK GRAIN STEM SAWFLY

Surveys made during the summer showed the black grain-stem sawfly more or less abundant in wheat fields over a wide area. Infestations were found in Kent and New Castle Counties, Del.; Baltimore Carroll, Cecil, Dorchester, Frederick, Montgomery, and Washington Counties, Md.; and in Adams, Butler, Centre, Cumberland, Franklin, Huntingdon, Indiana, Lycoming, Mercer, Mifflin, Northumberland, Perry, Union, and York Counties, Pa.; Augusta, Campbell, Caroline, Fauquier, King George, Loudoun, Prince William, Rockingham, Shenandoah, and Westmoreland Counties, Va.; and in Belmont, Carroll, Columbiana, Coshocton, Guernsey, Harrison, Holmes, Jefferson, Mahoning, Medina, Monroe, Noble, Portage, Stark, Summit, Trumbull, Tuscarawas, and Wayne Counties, Ohio. The infestation was by far the heaviest in eastern Ohio, where numbers were alarming in several counties. The infestation was found to have advanced considerably farther westward in that State this year. (E. J. Udine, Bureau of Entomology and Plant Quarantine, and J. S. Houser, Ohio Experiment Station.)

## EUROPEAN WHEAT MIDGE

A survey of the European wheat midge (Thecodiplosis mosellana Gehin) in western Washington was made in July. The survey extended the known infested area to Puyallup, in Pierce County, nearly 50 miles south of any previously known infestation. A number of heavily infested fields were found in the older infested district near Burlington, in Skagit County. In one field of spring-sown wheat it was estimated that over 50 percent of the wheat kernels had been destroyed. The infestation in Snohomish, King, and Pierce Counties was very light. The insect has spread through Snohomish and King Counties into Pierce County, notwithstanding the scarcity of wheat. In some places the small wheat fields are 18 miles apart. South of Puyallup conditions are more suitable for rapid spread of infestation. (M. M. Reeher, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## MORMON CRICKET

The mormon cricket outbreak in 1936 was as severe as, or worse than, in 1935. Some reductions in size and intensity of infestations were noted in Montana, Idaho, and Washington, but these were more than offset by increases in the other States. In addition to the eight States infested in 1935, small infestations were reported in California, North Dakota, and South Dakota. Considerable damage to crops was recorded in most of the States affected, although the losses were smaller in States where control work was carried on. Montana, where little or no control work was done, showed an estimated loss in grain for the Crow Indian Reservation alone of \$200,000. Utah reported losses to cattle range and crops of \$64,000 and Nevada, where a thorough control program was carried out, reported only \$1,000 loss to crops, with a saving of \$250,000, although damage to the range in some sections was quite severe. The crop losses reported in Washington and Idaho were also very low, compared to what they might have been had no control work been carried on. No estimates were made for Wyoming, Oregon, or Colorado. Only three States -- Idaho, Nevada, and Washington -- put on control campaigns in 1936. These were financed, for the most part, by W. P. A., E. C. W., and State funds. A total of 103,600 acres of cricket-infested land was treated in the three States, as follows: Idaho, 40,000; Nevada, 61,000; and Washington, 2,600. In addition, 11 miles of barrier were used in Idaho and 24 miles in Nevada. It was estimated that 300,000 bushels of crickets were trapped and destroyed in the latter State. From estimates submitted by the entomologists of the various States affected the following acreages were found to be infested in 1936: California, 40,000 (?); Colorado, 440,000; Idaho, 1,295,580; Montana, 1,029,000; Nevada, 1,142,768; Oregon, 164,700; Utah, 504,500; Washington, 135,000; Wyoming, 856,196; total 5,607,744. (F. T. Cowan, Bureau of Entomology and Plant Quarantine, U. S. D. A.)







LIMITS OF AREA KNOWN TO BE INFESTED BY ALFALFA WEEVIL



COUNTIES FIRST FOUND INFESTED 1935



COUNTIES FIRST FOUND INFESTED 1936

## ALFALFA WEEVIL

Surveys of major alfalfa districts within the weevil-infested territory showed the 1936 season opening with Box Elder, Salt Lake, and Sevier Counties, in Utah, and Washoe County, Nev., having one-fifth or less of the alfalfa fields with potentially injurious populations of adult weevils, while one-third of the fields in Jackson County, Oreg., and three-fourths of those in Mesa County, Colo., had destructive weevil populations. Spring weather conditions allowed the alfalfa crop to mature before the weevil attack developed, except in western Colorado. In other regions, threatening weather late in May and early in June delayed the first harvest, permitting damage that otherwise would not have occurred. Serious damage occurred only in Western Colorado, southwestern Oregon, and in a small tract, Eagle Valley, in Baker County, Oreg. Damage in Utah was light and somewhat below normal, occurring in Salt Lake, Box Elder, and Millard Counties. Slight damage was reported from Douglas, Lander, and Elko Counties, Nev. One field in Sioux County, Nebr., suffered severe damage. No damage occurred in infested regions of California and Wyoming. Surveys this fall show the majority of fields to have subnormal adult weevil populations in all districts except Mesa County, Colo., where three out of four fields are menaced. Other regions likely to experience damage in from 10 to 25 percent of the alfalfa fields in 1937 include the district comprising Delta and Montrose Counties, Colo., the Upper Snake River Valley of eastern Idaho, Box Elder County, Salt Lake County, and the district of Sevier and Sanpete Counties in Utah, Jackson County, Oreg., and Douglas County, Nev. This outlook is, of course, subject to modification by the weather next spring. Scouting during the summer resulted in new records of infestation in six counties distributed among five States; namely, Eagle County, Colo., Dawes and Box Butte Counties, Nebr., Harney County, Oreg., Daguerre County, Utah, and Fall River County, S. Dak. (the first infestation record in South Dakota). The accompanying map shows the present known limits of alfalfa weevil occurrence in the United States, and indicates the areas discovered as having been infested within the past two years. (J. C. Hamlin, R. W. Bunn, and W. C. McDuffie, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### VETCH BRUCHID

This summer Bruchus brachialis Fahr. was found heavily infesting vetch seed in the following counties in North Carolina: Alexander, Anson, Catawba, Cabarrus, Davidson, Davie, Forsyth, Gaston, Guilford, Iredell, Lincoln, Mecklenburg, Montgomery, Randolph, Rowan, Richmond, Stanly, Union, and Yadkin. The records of infestation in Alexander, Anson, Montgomery, and Richmond are new areas of infestation recorded this year. Percentage of infestation in all fields ran at least 50 percent, with maximums as high as 90 percent. During the year J. S. Pinkney reared two hymenopterous parasites from the vetch bruchid Lariophagus distinguendus (Forst.)(det. A. B. Gahan), heretofore not known to attack this insect, and Bruchebdus mayri (Masi)(det. A. B. Gahan), a European species not previously known to occur in North America.

#### CODLING MOTH

The codling moth, which was very much reduced in numbers at the beginning of the 1936 season in the Middle West and East because of unfavorable conditions in 1935, as well as heavy winter mortality in certain Midwestern States, staged a very rapid comeback in many orchards east of the Rocky Mountains. Some localities reported the worst infestation in years, the later broods being abnormally large. In Nebraska, Kansas, and Iowa, however, there was some repression during the drought period, apparently because of the excessive heat and dryness. In the Rocky Mountain States and the Northwest the winter mortality was reported as low. The infestations in most of these western areas were in general about normal. Exceptions to this condition were reported in Montana. (B. A. Porter, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### ORIENTAL FRUIT MOTH

The oriental fruit moth was on the whole less abundant and destructive than usual. Infestation generally lighter than normal was reported from Georgia, Maryland, Mississippi, South Carolina, Tennessee, and Virginia. Illinois reported general presence of this moth in the southern part of the State, but in reduced numbers, with early hot weather repressing the species. About the same condition was noted in Southern Indiana and Kentucky. Light infestations, with some twig injury but little fruit injury, were observed in Arkansas, Massachusetts, northern Indiana, Michigan, and Pennsylvania. Somewhat heavier infestation than usual was noted from Missouri (southeastern part early in season) and Ohio (northern part), and parts of New Jersey. Variable

/



infestation was reported from Connecticut, some fruit injury near New Haven being reported late in the season. Activity of the species was noted briefly in New York and Alabama. The insect was widely reported as active early in the season. Delaware reported the first emergence on April 5, adults were active in Virginia in April, and New Jersey noted activity earlier than last year. The first brood was reported as more noticeable than were later broods in parts of Connecticut, in Illinois, and in Kentucky; the second brood as the more noticeable in Michigan, New Jersey, Ohio, and Virginia. Delaware reported parasitization as low at the start, but building up as the season advanced. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### PLUM CURCULIO

The plum curculio was not unusually abundant in 1936. In the Southeastern States it was in general less abundant than normal, being so reported from Mississippi, Tennessee, South Carolina, and Georgia. In the last-named State it was noted as getting a late start in its spring activity. It was also less abundant in Ohio and Delaware. In lower New England it was more abundant than usual, according to reports from Rhode Island and Connecticut. In New York numbers were reported as varying with locality. In the Middle West, according to reports from Indiana, Illinois, and Missouri, the species was numerous and active at the start, but did not attract attention later in the season. The unusual drought and heat probably repressed it. The presence or activity of the species was also noted, without comment, from Alabama, Maryland, Michigan, Minnesota, New Jersey, Pennsylvania, Vermont, and Virginia. (F. M. Wadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### EASTERN TENT CATERPILLAR

Although egg masses of the eastern tent caterpillar were prevalent throughout New England and the Middle Atlantic States, there was evidence that the outbreak of the last 2 or 3 years is on the wane. Hatching of eggs was first observed about the middle of March in Arkansas and towards the end of the month in Delaware. Early in April eggs were hatching in the extreme southern part of New York and by the third week in April hatching was under way in New England. The caterpillars attracted so much attention in the New England and Middle Atlantic States that several communities launched campaigns in which prizes were awarded to school children, boy scouts, and other juvenile organizations for collecting egg masses. The Survey has not been informed as to how successful these campaigns were in reducing the number of caterpillars. As the season advanced the insects were quite prevalent throughout the outbreak area, but their numbers bore out the forecast of decided reduction in population over that of 1935.

## FRUIT FLIES

Through the use of traps set in the uncultivated lands of northern Mexico, data were accumulated during 1935-36 which greatly strengthened the theory that Anastrepha ludens Loew is a rather migratory species. Flies were trapped in locations many miles from any known wild or cultivated host and in an arid country that probably would not sustain a growing fly population throughout the year. The recurring infestations in the Rio Grande Valley probably result from flies that have reached this area from Mexico. It is believed that most of the flies trapped in northern Mexico and Texas originated in the heavily infested area about 125 miles south of the border. There is growing along the mountains of northern Mexico a favorite host, Sarjentina gregli, which fruits in the summer. Apparently adults leave this host when the fruit is gone late in the summer and at least part of them migrate northward in search of food and fruit for oviposition. Some of them eventually reach the Rio Grande Valley. The same conditions, apparently, that cause the flies to immigrate into the valley during the fall also force them to emigrate during the spring. When the fruit is removed from the trees during the harvesting season, the flies seem to leave the harvested grove also, and when the host-free period is in effect no flies are trapped in the valley. The trend of migration seems to continue northward, as flies are regularly trapped in the brush north of the valley late in the season.

## BOLL WEEVIL

The damage caused by the boll weevil in 1936 was probably less than it has ever been in any year since it became widely distributed over the Cotton Belt. The only areas that suffered more than normal damage were the eastern and southern parts of Texas. The light damage in 1936 was caused by a combination of factors. The weevils entering hibernation in the fall of 1935 were more numerous than usual in South Carolina and eastern Texas but less so than usual in Mississippi, Louisiana, and Oklahoma. The abnormally low winter temperatures caused a heavy mortality and the lowest survival in the hibernation cages ever recorded at Florence, S. C., and no survival at Eufaula, Okla. The survival at Tallulah, La., was also much less than normal but at College Station, Tex., it was several times higher than usual. The generally low survival over most of the Cotton Belt was followed by a very dry spring, with extremely high temperatures in May and June, which further reduced the number of weevils, except in eastern Texas. The drought was more prolonged in Oklahoma, where only 2.11 inches of rain fell in the 99 days from June 8 to September 14, and the weevil infestation was practically wiped out. At Tallulah, La., approximately 90 percent of the grubs in the infested squares were killed by climatic conditions during the latter part of June. As a result of the low survival and climatic control, the infestation did not build up to the



damage point until very late in the season and in many sections no control measures were necessary. Very little dusting was necessary for boll weevil control in the Delta district, where control is nearly always necessary. The exception to the above conditions was in eastern and southern Texas, where a high survival was followed by an excessively wet spring and summer, and the weevil damage was the most severe in many years. This low weevil population over most of the Cotton Belt was followed by an early and widespread infestation of leaf worms, which defoliated the cotton early and further reduced the weevil population that entered hibernation in the fall. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U.S.D.A.)

#### PINK BOLLWORM

The most outstanding events in connection with gin-trash inspection of the 1936 cotton crop were the finding of a new infestation of the pink bollworm in the lower Rio Grande Valley of Texas and the continued absence of infestation in the regulated part of Florida. This is the second consecutive crop season in which no infestation was found in Florida. The new infestation in Texas is apparently very light and involves four counties -- Cameron, Hidalgo, Starr, and Willacy. In the Plains counties of Texas, known as the Western Extension, infestation was found again this season. The last previous infestation in this area was in the 1934 crop, and in two of the counties involved no infestation had been found since the 1927 crop. For the past several years only sufficient inspection has been done in the older regulated areas to confirm infestation each year, and this practice was again followed. The counties involved are Graham and Greenlee, in Arizona; Dona Ana, Chaves, and Eddy, in New Mexico; and El Paso, Hudspeth, Pecos, Reeves, Ward, Presidio, and Brewster, in Texas. In these areas it is not practicable under existing conditions to attempt eradication and, therefore, only control measures have been enforced. In Brewster and Presidio Counties and the southwestern portion of Hudspeth County, Tex., a considerable number of worms are present and a small amount of commercial damage is done, but in the remaining counties infestation has always been so light that no commercial damage has ever resulted. (R. E. McDonald, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### COTTON LEAF WORM

As in 1935, the cotton leaf worm appeared early and was widely distributed in 1936. The first recorded appearance of the leaf worms this year was in Calhoun county, Tex., on May 5. Spreading northward and eastward, it was reported from College Station, Tex., on July 15; Louisiana, Arkansas, and Tennessee, on July 15 to 17; State College, Miss., on July 27; Stoneville, Miss., on July 30; Florence, S. C., on August 2; Tucson, Ariz., on August 12; and from Tifton, Ga., on August 14. Moths at lights were reported from Michigan on August 22, also from Connecticut on September 23, and from Maine on September 9.



During September and October worms were reported from all the cotton States except California, and moths were reported as abundant in the Northern States and Canada. The spread was more rapid and in general the infestation was more severe than last year. Poisoning was necessary as early as the first week in June in Southern Texas. Control measures were necessary in some fields in all parts of the main Cotton Belt and as far north and west as Missouri and Arizona. More poison was used for leaf worms than for boll weevils in the Delta. Unprotected fields were generally stripped during the latter part of July and August; however, the extremely dry and hot weather had caused early maturity of the cotton and concentration of worms on the younger fields so that a large part of the crop was matured before it was damaged. The general early defoliation of the plants stopped the late production of squares and bolls and greatly reduced the number of boll weevils entering hibernation. Although the leaf worm infestation was early and heavy and necessitated the expenditure of large sums of money for the protection of the immature crop, most of the fields that needed protection were poisoned and the actual damage caused was comparatively small. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### COTTON FLEA HOPPER

The peak of the emergence of the cotton flea hopper from overwintered eggs in southern Texas occurred at the end of April in 1936, or about 3 weeks later than normally. The total emergence from cotton plants in hibernation cages was about 20 percent greater this year than in 1934 or 1935; however, the field population was much lower than in those years, and for the first time in 4 years did not reach the point where control measures were needed in May. The principal factor responsible for the low field population in this section, where damage is usually great, was the excessively heavy rainfall, which killed great numbers of the newly hatched nymphs and caused an abundant growth of horsenint and other weeds on which the hoppers fed, delaying migration to the cotton fields. The light migration and infestation was shown by the lowest catch on the trap screens in several years. Although the field population increased somewhat during June, it never became high. Rains continued during the latter part of June and throughout July, the most important fruiting season of the cotton, and the excess moisture caused abnormal shedding of bolls and squares. The cotton did not react and produce a top crop, and the yields per acre and gains from the flea hopper control experiments were very low. In other sections of the Cotton Belt the damage caused by flea hoppers was normal, except in the Coastal Plains where damage was somewhat heavier than usual. In the Mississippi-Louisiana Delta Lygus pratensis (L.) and Adelphocoris rapidus (Say) caused more than average damage and considerably more than the flea hopper. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## MEALYBUGS

While apparently not markedly injurious, a concentration of mealybugs (Phenacoccus cavalliae Ckll.) (Det. H. Morrison) on cotton in the Pueria, Ariz., district is of interest, on account of its novelty. Several reports were received during the midsummer months of small areas of cotton north of Phoenix having a heavy infestation of mealybugs. One of these areas was investigated on August 21. The field visited is located about  $\frac{1}{2}$  mile north of Pueria. Several hundred cotton stalks were found to be heavily infested, some of the terminal twigs being encrusted several insects deep. The field was again visited on September 19, at which time it was found that the number of mealybugs had greatly decreased, with perhaps about only 10 percent present, as compared to the numbers observed on the occasion of the first visit in August. The field had been picked in the meantime and the number of burrs and bolls on the infested stalks showed little appreciable difference from those in the remainder of the field, indicating that little material damage had been inflicted by the infestation. (T. P. Cassidy, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## THRIPS

More reports of damage to cotton by thrips were received during 1936 than for the past several years. The extremely dry season, with the resultant poor stands and reduced vitality of plants, were contributing factors to the damage caused, as well as to the unusually large thrips population. The most extensive damage occurred in the South Atlantic States, although reports of serious local injury were received from most of the Cotton Belt. In northeastern Alabama most of the cotton in an entire county was practically defoliated during the latter part of June. At least 12 species of thrips were collected on cotton, the abundance and importance of the different species varying in different sections. Frankliniella fusca (Hinds) was reported from South Carolina, Alabama, and Mississippi; F. tritici (Fitch) from South Carolina and Mississippi; F. runneri Perg. from Mississippi; F. occidentalis Perg. from Arizona; F. gossypii Perg. from Texas; Sericothrips variabilis Bach. from South Carolina, Alabama, and Mississippi; Thrips tabaci Lind. from South Carolina and Alabama; Thrips panicus Moul. from South Carolina; Heliothrips fasciatus Perg. from California; Pseudothrips sp. from Alabama; and Aeolothrips duvali Moul. from Texas. (U. C. Loftin, Bureau of Entomology and Plant Quarantine, U. S. D. A.)



## MEXICAN BEAN BEETLE

The 1936 season was, on the whole, below average for the Mexican bean beetle east of the Mississippi River. Extremely high temperatures and drought checked development in many parts of the Eastern and Southern States. In the Ohio Valley the infestations were lighter than average, owing to low winter survival and unfavorable spring and summer weather. Late in the summer and in the fall the weather was favorable to development and a considerable number of the beetles entered hibernation. Along the Atlantic seaboard and the Chesapeake Bay survival over winter was somewhat below average, development was about average, and much damage was done to untreated bean crops, especially in Maryland and Virginia. In Delaware damage was below average. The infested area of New England suffered about average damage. Reports from Tennessee indicate a light infestation. Reports from Alabama and Georgia indicate that the increase late in the summer made control measures necessary. The capture of a Mexican bean beetle adult in a Japanese beetle trap in St. Louis indicates that the beetle is present in Missouri, which is the only hitherto uninfested State invaded in 1936. Reports of extension of infested territory include Lauderdale and Lamar Counties, Miss., and the Charleston, S. C., district. At Grand Junction, Colo., the infestation was about average, necessitating control measures. According to reports, the beetle was abundant in northern Colorado. In the Estancia Valley, N. Mex., the infestation was probably below average. (N. F. Howard, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## BEET LEAFHOPPER

The beet leafhopper situation during 1936 was very favorable. Little or no damage to beets occurred in the most important beet-growing sections of the country. Late in March the insects appeared in numbers in southern Texas and the early spinach crop was considerably damaged by curly top. Late in April there was a heavy infestation in Fresno County, Calif. One of the interesting observations of the year was the discovery that the hoppers survive the winter in the Billings, Mont., beet district, and also in Tooele County, Utah. About the middle of October the first fall adults were taken in southern Texas.

## CUTWORMS

During March and April reports were received from Kansas, Oklahoma, and Colorado, of more or less serious damage to wheat and alfalfa by the army cutworm, and early in March considerable damage was done to lettuce, melons, and other vegetables by the black cutworm in Arizona. About the middle of April considerable damage was done by cutworms to young cotton in parts of Texas and to grapes in California. In May cutworm damage was reported from a wide area from Virginia to Georgia on the Atlantic coast, westward to Iowa and Nebraska, many species of cutworms being involved. In Montana the pale western cutworm was



reported as more destructive than any year since 1932. In western Kansas many counties reported severe damage, 20,000 acres of wheat being destroyed in Rawlins County. Utah reported 7,500 acres of wheat destroyed in one county. Considerable damage to cereal crops was also reported from western North Dakota. The variegated cutworm was very destructive in the Mississippi Delta.

#### A WEEVIL

Late in June adults of Calomycterus setarius Roelofs began to appear in the known infested territory in the towns of Stratford and Sharon in Connecticut, and at Towson, Md. In Connecticut in July the adults, more numerous than in 1935, were feeding on lespedeza, desmodium, and other legumes, and in Maryland on alfalfa. A new infestation was discovered this year at Fairfield, Conn., where the adults were feeding on clover.

#### PERIODICAL CICADA

Breed X of the periodical cicada occurred this year in enormous numbers over the infested territory. A complete account of this insect, together with maps of Broods X and XXII, which were to occur in 1936, was published as series E-364, December 1935. In the following report of recorded occurrences in 1936, the names of counties are underscored.

#### Occurrence of Brood X:

Alabama:	<u>Geneva</u> , Geneva.
Delaware:	<u>New Castle</u> , Chestnut Hill, Iron Hill, Wilmington.
Georgia:	<u>Fannin</u> , Blue Ridge; <u>Habersham</u> , Cornelia; <u>Meriwether</u> ; <u>Murray</u> , Chatsworth; <u>Rabun</u> , Clayton; <u>Talbot</u> .
Illinois:	<u>Vernilion</u> , Danville.
Indiana:	<u>Knox</u> , Bicknell; <u>Orange</u> , Orleans; <u>Tippecanoe</u> , LaFayette; <u>Warrick</u> , Elberfeld; <u>Wayne</u> , Hagerstown, Richmond.
Maryland:	District of Columbia; <u>Allegany</u> , Cumberland; <u>Baltimore</u> , Baltimore, Texas, Timonium, Towson; <u>Cecil</u> , Conowingo Dam, Elkton, North East, Perryville, Red Point; <u>Frederick</u> , Lewiston; <u>Howard</u> , Florence; <u>Montgomery</u> , Ashton, Avenel, Avery, Bethesda, Chevy Chase, Gaithersburg, Glenmont, Norbeck, Rockville, Sandy Spring, Silver Spring, Somerset, Takoma Park, Wheaton; <u>Prince Georges</u> , Beltsville, Hyattsville, Laurel, Mount Rainier; <u>Washington</u> , Fairview; Hancock.
Michigan:	<u>Calhoun</u> , Albion; <u>Cass</u> , Cassopolis; <u>Genesee</u> , Grand Blanc; <u>Kalamazoo</u> , Kalamazoo; <u>Lenawee</u> , Adrian, Tecumseh; <u>Saint Joseph</u> , Lakeport Township; <u>Van Buren</u> , South Haven; <u>Washtenaw</u> , Ann Arbor.

Missouri: Dunklin, Campbell, Malden.  
New Jersey: Essex, Hillside, Newark; Mercer, Glen Moore, Hopewell,  
Princeton; Morris, Lincoln Park.  
New York: Erie, Buffalo; Nassau, Farmingdale, Massapequa;  
Richmond; Suffolk, Babylon, Brightwaters, Deer Park,  
Lindenhurst, Mastic, North Babylon.  
North Carolina: McDowell, Old Fort; Wilkes.  
Ohio: Allen; Angelaize; Brown; Butler; Champaign, Urbana;  
Clark, Springfield; Clermont; Clinton; Crawford,  
North Robinson; Darko; Delaware, Delaware; Fairfield,  
Bloom Township; Fayette, Washington (Court House);  
Franklin, Columbus, Grandview Heights, Upper Arlington;  
Gallia, Greene, Clifton; Guernsey; Hamilton,  
California, Cincinnati, Mount Airy, Mount Washington;  
Hancock; Hardin; Logan, Bellefontaine; Madison; Marion;  
Mercer; Miami; Montgomery; Dayton; Pickaway, Derby,  
South Bloomfield, Williamsport; Proble; Shelby, Kett-  
lersville; Union, Milford Center; Van Wert; Warren;  
Wyandot.  
Pennsylvania: Adams, Aspers, Biglersville; Armstrong, Mahoning  
Township; Bedford, Bedford Township, Defiance,  
Lincoln Township; Schellsburg; Berks, Bechtelsville,  
Birdsboro, Brecknock Township, District Township,  
Hill Church, Landis Store, Mertztown, Morgantown,  
Mount Penn, Reading, Wernersville; Blair; Bucks,  
Danboro, Dublin, Hilltown Township; Mechanicsville,  
Ottsville, Pipersville; Butler; Cameron, Emporium;  
Carbon, Franklin Township, Laurence Township, Le-  
high, Lehigh Township; Centre, Powerton; Chester,  
Avondale, Barnston, Brandyvine Manor, Castle Rock,  
Chester Springs, Chesterville, Chrome, Clonwell,  
Coatesville, Cochranville, Compass, Doe Run, Downing-  
town, Elverson, Exton, Glen Moore, Gum Tree, Kembles-  
ville, Kennett Square, Kimberton, King of Prussia,  
Landenburg, Lewisville, Lincoln University, Lionville,  
London Grove, McCorkles Rocks, Marshallton, Norris-  
town, Nottingham, Paoli, Parkersburg, Peacedale,  
Phoenixville, Rosedale, Sadsburyville, Tanguy, Thorn-  
dale, Toughkenamon, Valley Forge, Walnut Hill, War-  
wick, West Chester, West Grove, Westtown, White Horse,  
Whitford, Willistown, Wyebrooke; Clearfield; Clinton;  
Columbia; Cumberland, Carlisle, Shippensburg; Dauphin,  
Halifax Township, Middle Paxton Township, Swatara  
Station; Delaware, Bethel Township, Castle Rock, Chelsen,  
Chester, Chester Heights, Concordville, Elam, Media,  
Newton Square, Radnor, Springton, Twin Bridges, Upland;  
Fayette, Charlestown; Franklin, Antrim Township, Cham-  
bersburg; Mason and Dixon (on Conococheague Creek),  
Roxybury, Saint Thomas, Spring Run; Fulton, Bethel  
Township, Union Township; Greene, Jefferson Township;

Huntingdon, Hopewell Township, Huntingdon, Logan Township, Shade Gap, Shade Township, Todd Township; Jefferson, Ringgold Township; Juniata, East Waterford, Nock; Lancaster, Aberdeen Station, Bart, Christiana, Elizabethtown, Gap, Holtwood Dam, Pequea, Quarryville, Safe Harbor Dam; Lawrence, North Beaver Township; Lebanon, Mount Gretna, South Armville Township; Lehigh; Luzerne; Lycoming, Anthony Township, Jersey Shore; Mifflin, Lewistown, Oliver Township; Montgomery, Bryn Mawr, Limerick Township, Pennsburg, Pottstown, Schwenkville, Spring Mount; Montour, Northampton; Northumberland, Lower Mahony Township; Perry, Juniata Township, Loysville; Potter; Schuylkill; Snyder; Somerset; Union; Westmoreland, Madison; York, East Hopewell Township, Etters, Hellan, Loganville, Pigeon Hills, Strinestown, York, Zions View.

Tennessee: Carter; Hamilton, Signal Mount, Seddy; Johnson; Knox, Knoxville, Mascot; Loudon; Rhea; Roane; Washington, Johnson City.

Virginia: Alexandria (Independent City); Charlottesville (Independent City); Arlington, Cherrydale, Clarendon; Clark; Fairfax, Falls Church; Frederick, Winchester; Loudoun, Leesburg; Prince William, Dumfries.

West Virginia: Berkeley, Martinsburg; Jefferson.

Occurrence of Brood XII in 1936

Arkansas: Crittenden, Bridge Junction; Faulkner, Palarn; Little River, Ogden; Miller (near Fulton, Hempstead County).

Louisiana: East Baton Rouge, Baton Rouge.

Mississippi: Adams; Oktibbeha, State College; Warren, Vicksburg.



## CANKERWORMS

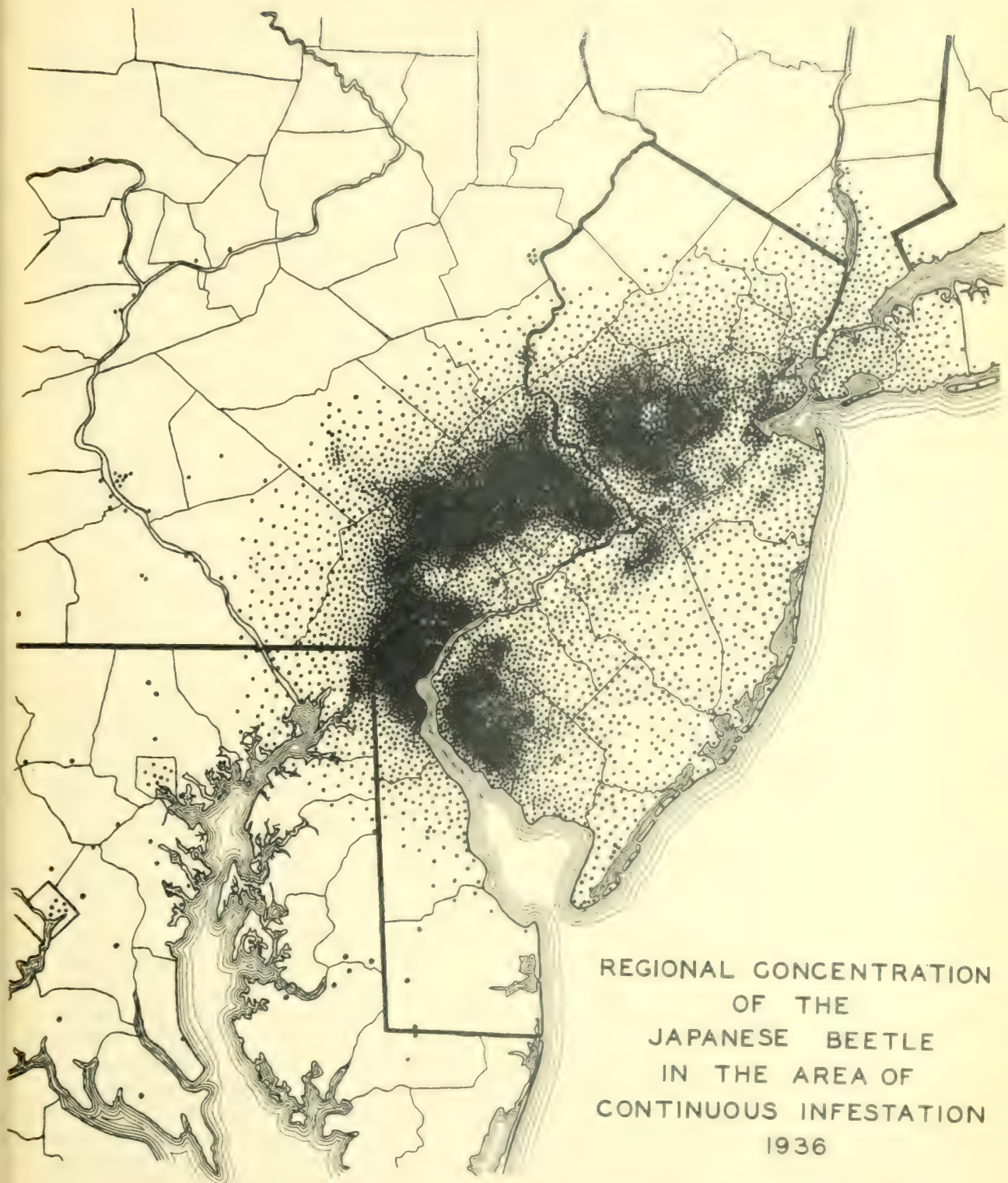
Cankerworm eggs began hatching in the East in May and in the Southern States early in March. Serious damage to both orchards and forest trees was reported from New England, the Middle Atlantic States, and the East Central States. In June considerable defoliation took place locally in Western Maine, Massachusetts, eastern New York, northern New Jersey, and northeastern Pennsylvania. Other infestations appeared in eastern Ohio, northern Indiana, and Illinois, extending into Wisconsin, Minnesota, Iowa, and Nebraska.

## FOREST TENT CATERPILLAR

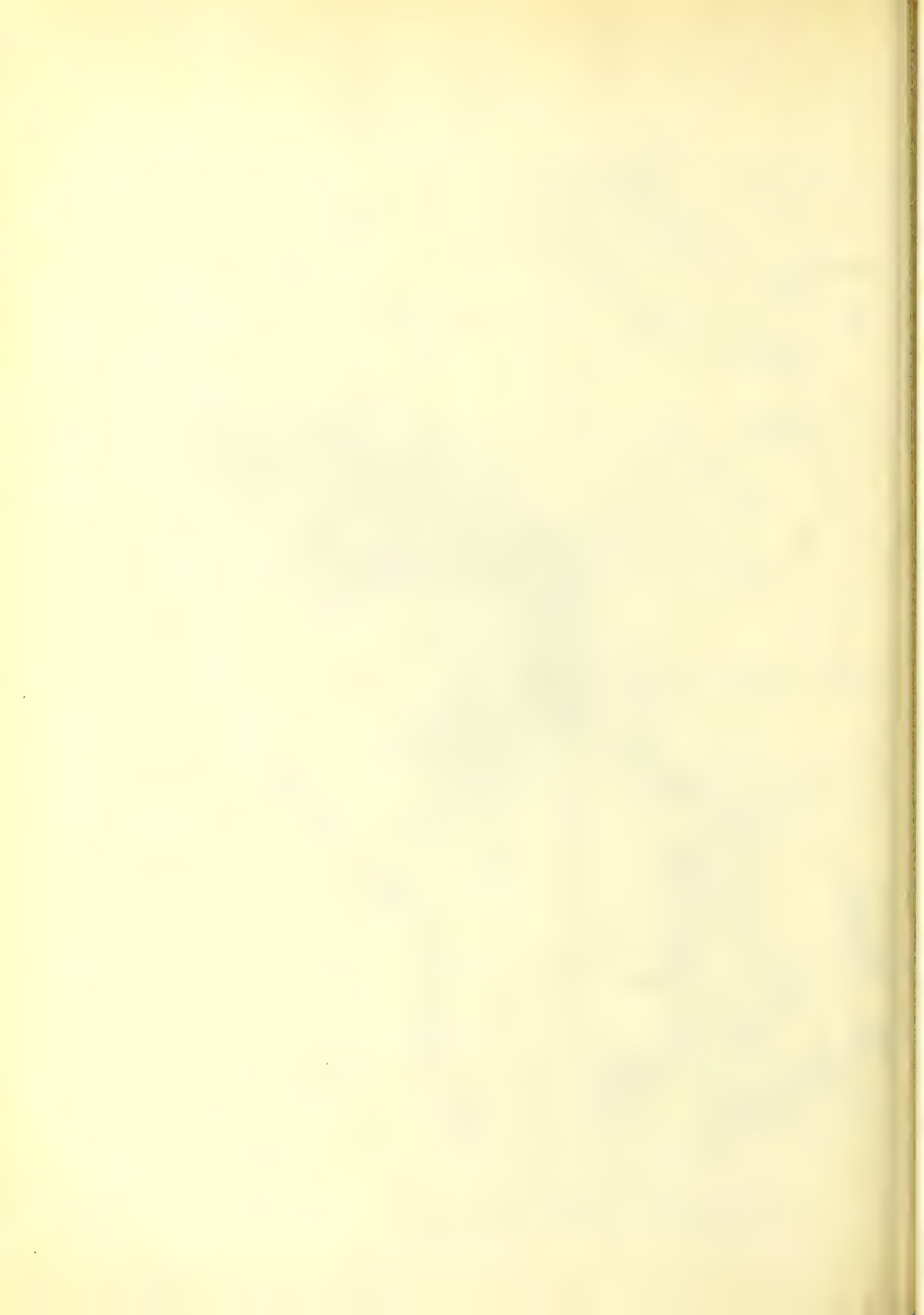
Late in April a very heavy infestation of this insect occurred in southern Mississippi, where, in many areas, sweetgum and oak were completely defoliated. As the season advanced reports of serious damage were received from Utah and Washington, and in June almost unprecedented outbreaks occurred throughout New England and New York. One defoliated area in the State of Maine included 60,000 acres of mixed timber. Throughout the East damage was particularly severe on sugar maple and elm. The outbreak extended westward over northern Michigan into Minnesota.

## JAPANESE BEETLE

Insofar as the status of the Japanese beetle in the area of general or continuous infestation is concerned, the year 1936 is notable in several ways. For the first time since the beetle has been known to occur in the United States, there was a very considerable mortality of the grubs, resulting from the extreme cold weather in January and February, coupled with the lack of a sufficient blanket of snow covering the ground. Heavy larval mortality occurred in parts of southwestern New Jersey, the southeastern corner of Pennsylvania, northern Delaware, and in the northeastern corner of Maryland, the destruction of grubs in this area ranging from a few to as high as 80 percent. During previous winters, grub mortalities have seldom run higher than 10 percent throughout this area. Throughout other portions of the area of continuous infestation, however, larval mortality, in general, did not run appreciably higher than the average of previous years. As a consequence of the reduction in grub population late in the winter, there was observed during the summer beetle season a general decrease in both beetle abundance and plant injury in the same portions of New Jersey, Pennsylvania, Delaware, and Maryland, with some localized points of heavy beetle abundance and plant injury where winter conditions were more favorable. On the other hand, throughout those parts of the area of general infestation lying outside this restricted area, there was observed the customary general increase in beetle abundance and plant injury which was anticipated. This increased abundance and injury was particularly notable in sections north and northwest of Trenton and in parts of Salem and Cumberland Counties, in New Jersey; in New Castle County, south of Wilmington,



REGIONAL CONCENTRATION  
OF THE  
JAPANESE BEETLE  
IN THE AREA OF  
CONTINUOUS INFESTATION  
1936





Del.; in small areas east of Elkton, Md.; and in sections in Chester, Berks, Montgomery, and Bucks Counties in Pennsylvania. Considerable increase in plant injury was also reported within the metropolitan area of New York City, both in New Jersey and in New York. The usual extension of the area of general infestation was observed, this area being extended outward in practically all directions for distances up to 5 miles or thereabouts. Observations at a number of the isolated colonies in New England indicated a decided increase in beetle population at practically all of these places. It is of interest to note that definite increases in beetle abundance were observed in 1936, as compared with 1935, at a number of points in Central New England that suffered severe property damage from the unprecedented floods of the winter of 1935 and spring of 1936. The flooding of valleys and portions of towns appeared to have no deleterious effect upon the overwintering grub populations at these points. In a considerable portion of the area of continuous infestation the summer rainfall of 1936 was below normal, this deficiency being quite acute in extensive tracts during the greater part of July and the early part of August, corresponding with the period of normal heavy oviposition. Based upon observations of past years, during which a marked deficiency of summer rainfall resulted in a reduction of the beetle population of the following season, it appears likely that a general reduction in the beetle population may occur in a large proportion of the area of general infestation in 1937, with the possible exception of the outlying areas where the population build-up is normally very rapid. (C. H. Hadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Established infestations in Brewer, Maine, Burlington, Vt., and Grafton, and Hollidays Cove, W. Va., were the most important first records determined during the summer of 1936. The major developments disclosed by trap scouting were the increases in beetle population in Chicago, Ill.; Cleveland, Youngstown, East Liverpool, Canton suburban area, Steubenville, and Marietta, Ohio; Buffalo, N.Y.; and Chester, Parkersburg, Clarksburg, and Fairmont, W. Va. Control programs of combined trapping and soil treatment resulted in more than 90-percent reduction in beetles caught in Saint Louis and substantial reductions in the infestations in Indianapolis, Ind., and Erie, Pa. Late treating in Detroit did not affect this year's emergence and the catches there were higher than last year. Trapping in Virginia and the Carolinas disclosed about the same conditions as in 1935. A slight increase in the infestation in Pulaski, Va., and reappearance of the insect in Charleston, S. C., were the only major finds over those recorded during 1935 in these States. Incipient infestations of a few beetles each were found in Louisville and Lexington, Ky.; Bristol, Tenn.; and Augusta and Savannah, Ga. Minor first record infestations were disclosed in Fort Wayne and South Bend, Ind.; Dearborn, Mich.; Lockport, N.Y.; and Sharon and Warren, Pa. A number of small catches of previous years were repeated in other cities and towns in North Carolina, West Virginia, Virginia, Ohio, and New York. Twentyfour infestations, including five sizable ones, were found in the Maryland nonregulated area. (L. H. Worthley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## ASIATIC GARDEN BEETLE

No general surveys have been conducted during the year to determine the spread or abundance of the Asiatic garden beetle; however, observations in northern New Jersey during the spring of 1936 indicated a definite reduction in larval population at a number of points where adults were abundant in 1935. This condition was likewise observed at the colony center of this species in the Philadelphia district. Trap collections reported from northern New Jersey, observations in the Philadelphia district, and general correspondence indicated a decided reduction in the adult population and plant injury during the summer of 1936. (C. H. Hadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## ORIENTAL BEETLE

Although no general survey was made during the year to check on the status of the oriental beetle, limited observations and correspondence indicated a reduction in this species in northern New Jersey. On the other hand, the beetle is reported to have caused considerable injury to turf in untreated lawns in the general vicinity of New Haven, Conn. The occurrence of this species was observed for the first time in Springfield, Mass., where large sections of turf on private grounds were severely injured by grubs. (C. H. Hadley, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## SMALLER EUROPEAN ELM BARK BEETLE

Scouts searching for the Dutch elm disease in elms along the railroad rights-of-way through Northern West Virginia discovered an infestation of Scolytus multistriatus Marshan at Parkersburg, W. Va. By following river valleys, scouts found the beetle in an area roughly bounded by Wheeling, Glenville, and Charleston, W. Va.; and Iron-ton, Wellston, Athens, and McConnelsville, Ohio, comprising approximately 7,500 square miles. Intensive sampling of beetle-infested trees in the vicinity of Parkersburg and various other points throughout this area has failed to disclose any Dutch elm disease infections.

Cooperative trap-log experiments afforded a sampling of the population of this species throughout the territory known to be infected with the Dutch elm disease and the 10-mile protective band surrounding it. The area within an approximate radius of 50 miles of New York City, including all the major infected zone, was divided into blocks 4 miles square. Four elm logs were placed as nearly as possible in the center of each block. After approximately 4 weeks' exposure, the logs were collected from 456 blocks. S. multistriatus was found in logs from 89 blocks, rather widely scattered throughout the entire section trapped. The heaviest concentrations of this species, as disclosed by the trap logs, are in the vicinity of Somersville and Bound Brook, and Bernardsville, in Somerset County, Clinton



and Glen Gardner, Hunterdon County, and Norwood, Bergen County, N.J.; Ossining, Westchester County, and Salisbury Mills, Orange County, N.Y.; and Redding, Fairfield County, Conn. Beetles were taken in only 2 out of 50 blocks trapped in Pennsylvania. The positive finds in the latter State were in blocks a few miles west of Trenton. Recoveries were made from only 2 squares of 42 blocks comprising the rather limited trapped area on Long Island. Beetles were taken from scattered blocks along or near the periphery of the entire trapped zone. (L. H. Worthey, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### GYPSY MOTH

The hatch of gypsy moth egg clusters in the spring was quite variable, as the low temperatures during the winter of 1935 and 1936 caused the killing of quite a number of them. The killing temperatures, however, were not uniform in many sections of the infested areas, as a number of the exposed egg clusters in some localities hatched during the season. Egg clusters below the snow line showed a high percentage of hatch. During the summer a total of 428,622 acres of woodland was partially or totally defoliated.

In Maine there was a slight decrease in defoliation over 1935, and a considerable decrease in New Hampshire and Rhode Island. In Massachusetts the amount of defoliation increased considerably over that recorded for the season of 1935. This was due to the great increase in two of the counties in the southeastern section of the State, namely, Bristol and Norfolk Counties. In the former, over 45,000 acres were recorded as showing at least noticeable defoliation, whereas in 1935 only about 800 acres were recorded. In Norfolk County the total defoliation for 1936 was 13,000 acres, as compared to 45 acres in 1935.

With the exception of Massachusetts, defoliation in general over the entire area was considerably less than it was in 1935, though scattered towns showed increase.

In both Vermont and Connecticut no noticeable defoliation was recorded, whereas in 1935 several acres of noticeable defoliation were found in some localities in both of the States. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)



#### BROWN-TAIL MOTH

During the fall and winter of 1935-36, brown-tail moth webs were cut over the infested area in Maine, New Hampshire, Massachusetts, and Rhode Island. In Maine, 1,256,085 brown-tail moth webs were cut and destroyed; in New Hampshire, 2,786,461; in Massachusetts, 629,767; and in Rhode Island a total of 306 were found in two towns in the eastern part of the State, this being the first infestation found in Rhode Island for a number of years. During the summer of 1936 there were no reports of extensive defoliation, although slight defoliation was noted in a few towns in northeastern Massachusetts. In Maine and New Hampshire no noticeable defoliation was noted during the season of 1936. In late summer a number of winter webs were noted in southern Maine, southern New Hampshire, and northeastern Massachusetts. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### SATIN MOTH

In some sections of the infested area in New England, records made during the summer of 1936 indicated that the satin moth is increasing quite rapidly. Although no extensive areas of defoliation were noted, heavy feeding was noted in southern Maine, southeastern and central New Hampshire, eastern Massachusetts, and near Bridgeport in southwestern Connecticut. In Rhode Island some of the towns were generally infested, but no areas of noticeable defoliation were noted and no increase over the degree of infestation in 1935 was noted. (A. F. Burgess, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### SCREWORM

By November 13 a total of 43,206 cases of screwworms and magots was reported in the Southeastern States and were distributed as follows: Alabama, 507; Florida, 39,912; Georgia, 2,116; Louisiana, 255; Mississippi, 297; and South Carolina, 119. In Georgia most of the cases were reported from the southern counties during the autumn months. Of 39,912 cases reported from Florida from January 1 to November 13, 21,992 cases occurred during the months of June, July, August, September, and October, the period when screwworms would normally be most prevalent. Cases were widely distributed in the State throughout the year but were not permitted to cause an outbreak in any locality. From June 19 to the 13th of November, 126,380 cases of screwworms and magots were reported from the Southwestern States, of which 102,429 occurred in Texas; 21,269 in New Mexico; 942 in Oklahoma; 590 in California; and 1,150 in Arizona. The weather during this period was such that screwworms would ordinarily be expected to occur in large numbers. The rainfall was regularly enough to keep wounds moist and attractive for flies, but was not sufficient to drown larvae and pupae in the soil.

Even though a high degree of control was obtained for screwworms in the Southwestern States, the spread of the pest resulted in cases in six counties of Oklahoma, several localities in Kansas, and in Missouri, Illinois, and Tennessee during the early part of the season. In the stockyards men employed by owners to handle cattle looked for cases of screwworms, treated the animals, and aided in getting specimens for identification. At Kansas City, Mo., there were 10 such infestations; at East St. Louis, Ill., 39; at Kaplan and Church Point, La., 3 in horses and mules; at New Orleans 10 lots were identified from 59 different infestations; and at Nashville, Tenn., 1 case was found. Screwworms became established in the vicinity of Memphis, Tenn., and caused losses in several of the southwestern counties of the State. (W. E. Dove, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

## MOSQUITOES

Information received from the State entomologist of New York and the Nassau County Extermination Commission indicates that an unusually dry summer on most of Long Island and throughout much of the State resulted in fewer mosquitoes than normal early in the summer and in midsummer but later rains and storms brought out heavy local broods late in the summer and early in the fall. The storms and floods provided extensive breeding places for the fresh-water species, Aedes vexans Meig., Culex pipiens L., and the salt-water breeders, A. sollicitans (Walk.) and A. cantator (Coq.). A large brood of Mansonia perturbans Walk. emerged in Suffolk County N.Y. in June. Along the mid-Atlantic seaboard September storms caused a slight increase in abundance of salt-marsh mosquitoes, but during the rest of the year the numbers were approximately normal. In New Jersey a heavy emergence of A. vexans occurred in the upper Passaic Valley as a result of extensive flood waters. Emergence began about June 26. Immediately after that date some mosquitoes were observed along the lower Passaic, but none were present when a status was taken along the west side of the two mountain ranges toward the upper end of the breeding area. This was about 4 miles from the principal breeding area. By July 4, mosquitoes that probably bred on the upper Passaic, had come across the mountains and filtered into all the towns and cities to the east and south to a distance of some 15 miles from the large breeding area on the upper Passaic River.

In Delaware, conditions for mosquito breeding were more favorable in 1936 than in 1935, with an apparent general slight increase in the number of pestiferous species. However, over a 5-year period there has been a steady reduction in abundance, particularly of the salt-marsh species, as indicated by trapping records.

An unusually dry spring and summer was perhaps responsible for a greatly decreased abundance of salt-marsh mosquitoes along the Georgia coast. Annoyance from these pests in that area was reported at its lowest ebb for several years. The dry weather also probably accounted for fewer complaints this year from fresh-water and domestic species.



Data obtained from collections of light traps operated at various places in Florida indicate that generally the relative abundance of the more important species in the State was considerably less in 1936 than in 1935.

Along the Gulf coast, there has been no indication that salt-marsh species of mosquitoes have been more abundant in 1936 than usual. Certain cities and towns in Texas suffered considerable annoyance from A. aegypti (L.) and a few cases of dengue fever were reported; however, no epidemic of the disease occurred.

On the west coast in Oregon and Washington, after the flooding of the Columbia and Willamette Rivers, the primary brood of A. vexans and A. aldrichi Dyar and Knab emerged soon after April 21. Two successive broods emerged on May 18 and June 11 and these species continued to be generally abundant and troublesome until July 17, when high temperatures and low humidity caused a rapid decrease in numbers. C. pipiens caused considerable annoyance in a few localities during the summer in Oregon. Sixty-six cases of malaria were reported in Oregon in 1936, the largest number of cases occurring in the State in any year since 1918, when malaria was first required to be reported to the State Board of Health. Eighty-three percent of these cases occurred in August, September, and October. Anopheles maculipennis Meig., the principal vector of malaria in the State, was found to be very abundant in the vicinity of Prineville, Oreg., although no cases of malaria were reported from that locality. In the Cascade mountains, the snow-water species were reported abundant about May 2. The numbers of these species, however, did not appear to be above the average during 1936. (F. C. Bishopp, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### ROCKY MOUNTAIN SPOTTED FEVER TICKS

Reports from the Rocky Mountain region indicate that the Rocky Mountain spotted fever tick (Dermacentor andersoni Stiles) was about normal in abundance in 1936. Aside from its importance as the vector of Rocky Mountain spotted fever of man, it plays a continuous role in the transmission of tularemia and it is also of distinct importance as a parasite and annoyner of man and animals. This tick has been determined for the first time as occurring in Arizona. This record consists of a male specimen sent from the Lukachukai Mountains, Ariz., on Jun. 23, 1936. The number of cases of Rocky Mountain spotted fever in the West was about normal. The death rate, as usual, varied widely, in different sections, ranging from about 5 to about 80. The total number of cases reported to the United States Public Health Service up to November 1 was 166, and were distributed as follows: Montana 56, Wyoming 45, Oregon 32, Idaho 23, Colorado 7, Utah 1, California 1, and Arizona 1.



The American dog tick (D. variabilis (Say) ), which transmits Rocky Mountain spotted fever in the East, appears to have been rather less abundant than normal in the mid-Atlantic States. It was more abundant than usual, however, on Cape Cod and on adjacent islands in Massachusetts. In this area the tick is extremely abundant and annoying to people, dogs, and horses, though fortunately Rocky Mountain spotted fever and tularemia do not appear to exist there.

The number of cases of Rocky Mountain spotted fever in the East this year, as reported to the United States Public Health Service up to November 1, was 142, distributed as follows: Virginia 51, North Carolina 30, Maryland 28, District of Columbia 7, Tennessee 6, Illinois 6, Pennsylvania 5, Delaware 3, Kentucky 3, West Virginia 1, Georgia 1, and Alabama 1. The mortality, as usual, ran about 25 percent. (F. C. Bishopp, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

#### NEW RECORDS OF INSECTS

Specimens of the following insects have been identified from collections made in the United States. Specimens determined by L. L. Buchanan as Gymnaetron (Rhinusa) netum Germar, a European curculionid not before reported from North America, have been detected in the National Museum collection, mixed with lots of the common G. (R.) teter Fab., the localities represented including points in New York, New Jersey, Connecticut, Pennsylvania, Virginia, and Iowa. The earliest date is July 3, 1914, on specimens collected at Farmingdale, N. Y. A series from Barcroft, Va., was reared by J. C. Bridwell from seed pods of Linaria vulgaris. Two specimens of a weevil identified by L. L. Buchanan as Naupactus leucolema Boh. were received from A. N. Tissot, Agricultural Experiment Station, Gainesville, Fla. The weevils were reported to be injuring peanuts at Crestview, Fla. This species, which has not heretofore been known from North America, was described from Tucuman, Argentina, and has been reported also from Chile, Uruguay, and New South Wales. At the last-named locality the larvae were found attacking roots of lucerne. Specimens of delphacid, collected on sugarcane at Fellsmere, Fla., on September 26, by J. W. Ingram and E. K. Bynum, of the Bureau of Entomology and Plant Quarantine, have been identified by P. W. Oman as Saccharosydne saccharivora (Westwood). This appears to be the second record of S. saccharivora, a common West Indian species, occurring in the United States, it having been previously recorded by Van Duzee in 1909 from a single specimen collected at Tampa, Fla. Mr. Ingram stated that the species was causing rather severe injury to sugarcane at Fellsmere and that nymphs were also found in small numbers on Digitaria sanguinalis, Paspalum urvillei, and Dactyloctenium aegyptium. References concerning saccharivora in the West Indies indicate that, although the species is common, it is usually not a severe pest of cane. Some of the nymphs included in this sending were parasitized by larvae of a dryinid, according to R. A. Cushman. Two specimens of a parasite reared from Trachalus tabidus (F.) taken at Adamsville, Pa., have been

identified by C. F. W. Muesebeck as Microbracon terebella (Wesm.). The material was reared by E. J. Udine, of the Bureau of Entomology and Plant Quarantine. These are the first specimens of this parasite to be recorded from the United States. Specimens reared from Pseudococcus comstocki Kuw. by R. N. Jefferson, at Blacksburg, Va., have been determined by A. B. Gahan as the encyrtid Clausenia purpurea Ishii. This species was originally described from Japan and was not previously known to occur in the United States, although an apparently unsuccessful attempt to introduce it into California was made in 1916. Mymaridae reared from eggs of the cotton flea hopper (Psallus seriatus Reut.) at Port Lavaca, Tex., by H. J. Crawford, have been identified by A. B. Gahan as a new species of Erythmelus near gracilis: (How.) and Anaphes anomocerus Girault. So far as known, no parasites have previously been recorded from this important cotton insect. The new species of Erythmelus appears to be the more abundant parasite of the two, 54 specimens of that species having been sent in for identification while only 3 specimens of A. anomocerus were submitted. A. anomocerus was originally described by Girault from specimens reared at Sale Lake City from eggs of Halticus citri Ashm. on alfalfa, and was treated as a variety of A. icle Girault. Mr. Gahan doubts whether the slight differences which distinguish it from A. icle are even of varietal importance. The typical A. icle is said to be parasitic in eggs of Hypera nigrirostris F., and is recorded from Illinois and Virginia. Nothing is known of the distribution of the supposed new species of Erythmelus. Two specimens of a species of Tachinidae reared from Grapholitha molesta Busck by R. B. Neiswander, of the Ohio Agricultural Experiment Station, have been identified by D. G. Hall as Admontia degeerioides Coq. This appears to be the first record of this host-parasite association.

There was received for identification a series of specimens reared from eggs of the black widow spider at Wichita, Kans., by H. H. Walkden. Several additional specimens of the same species, also reared from the eggs of that spider, were submitted by W. J. Baerg, of the University of Arkansas. C. F. W. Muesebeck has identified the parasite as a new species of Baeus, a genus of Scelionidae. On several occasions recently a dipterous parasite of the black widow spider has been received for identification from southern California and has been determined by David G. Hall as Pseudegaurax signata Loew, a species of Chloropidae. These parasites have been known to develop in the egg sacs of spiders, but seen not to have been previously recorded from the black widow spider. (C. F. W. Muesebeck, Bureau of Entomology and Plant Quarantine, U. S. D. A.)

Corrections--The powder-post beetle damaging lawn furniture, is not Lyctus sp., as published in the Insect Pest Survey Bulletin, Volume 16, Number 9, page 426, November 1, 1936. According to Doris H. Blake, in a paper on the flea beetles. (Proceedings of the Entomological Society of Washington, Vol. 38, No. 2, Feb. 1936, pp. 13-14), the notes on the alder flea beetle (Altica binarginata (Say)) in the Insect Pest Survey Bulletin, September 1, 1936, (p. 348) should be referred to A. ambigua alni (Harr.).



# INSECT PEST SURVEY BULLETIN

Vol. 16	1936	Index
	<u>No.</u>	<u>Page</u>
Ballou, C. H.: "Insect notes from Costa Rica in 1935"--9 (Sup.)		437-497
Beck, E. W., and Bradley, W. G.: "Colonization of parasites of the European corn borer in United States in 1936"-----9 (Sup.)		499-505
Bradley, W. G., and Beck, E. W.: "Colonization of parasites of the European corn borer in the United States in 1936"-----9 (Sup.)		499-505
"Chinch bug abundance in hibernation quarters, November -December 1935", article by C. M. Packard-----1 (Sup.)		25
Collaborators, Insect Pest Survey, list-----1		1-4
"Costa Rica, insect notes from in 1935", article by C. H. Ballou-----9 (Sup.)		437-497
"European corn borer, parasites of, colonization in the United States in 1936", article by W. G. Bradley and E. W. Beck-----9 (Sup.)		499-505
"European corn borer, report on status of in 1936", article by A. M. Vance-----9 (Sup.)		429-436
"European corn borer surveys, results in thirteen selected counties, 1935", article by L. H. Worthley---4 (Sup.)		149-156
"Grasshoppers, species and distribution in the 1936 outbreak", article by R. L. Shotwell-----5 (Sup.)		213-259
"Hessian fly infestation at harvest time in 1936", article by C. M. Packard-----6 (Sup.)		309-311
"Insect notes from Costa Rica in 1935", article by C. H. Ballou-----9 (Sup.)		437-497
Insect Pest Survey, reporters, list-----1		1-4



	<u>No.</u>	<u>Page</u>
Packard, C. M.:		
"Chinch bug abundance in hibernation quarters, November-December 1935"-----	1 (Sup.)	25
"Hessian fly infestation at harvest time in 1936"-----	6 (Sup.)	309-311
Reporters for Insect Pest Survey, list-----	1	1-4
Shotwell, R. L.: "The species and distribution of grasshoppers in the 1936 outbreak"-----	5 (Sup.)	213-259
Vance, A. M.: "Report on status of European corn borer in 1936"-----	9 (Sup.)	429-436
Worthley, L. H.: "Results of European corn borer surveys in thirteen selected counties, 1935"-----	4 (Sup.)	149-156

(Common names listed separately at the end)

	<u>No.</u>	<u>Page</u>
Acanalonia virescens (Stal) -----	9 (Sup.)	471
Acenthocephala bicoloripes (Stal) -----	9 (Sup.)	479
Acenthocephala declivis guatemalena Dist.	9 (Sup.)	479
Acenthoderes circumflexus Duv. -----	9 (Sup.)	439
Aceratagallia sordida Oman -----	9 (Sup.)	456
Achatodes zeae Harr. -----	7	348
Aconophora nitida Fowl. -----	9 (Sup.)	474
Aconophora pallescens Stal -----	9 (Sup.)	474
Acrassa coa Schaus -----	9 (Sup.)	491
Acrididae -----	3	59
	4	95, 98-99
	5	157, 159, 161
	5 (Sup.)	213-259
	6	261, 263-266
	7	313, 314, 317-318
	8	355, 356
	9	393, 394, 396-397
	10	510, 511-513
Acrobasis caryae Grote -----	3	73-74
	4	96, 120
	5	281
	8	366
Acrobasis juglandis LeB. -----	3	74
	4	103, 120
	8	366
Acroleucus brevicollis (Stal) -----	9 (Sup.)	480
Acrolophitus hirtipes Say -----	5 (Sup.)	219
Acrosternum hilaris Say -----	4	126
Acrosternum marginatum (Beauv.) -----	9 (Sup.)	480
Acutalis fusconervosa Fairm. -----	9 (Sup.)	474
Adelphocoris rapidus (Say) -----	10	522
Admontia degeeriodes Coq. -----	10	536
Aedes aegypti L. -----	6	306
	9	422
	10	534
Aedes aldrichi Dyar & Knab -----	5	210
	9	423
	10	534
Aedes cantator Coq. -----	3	82
	4	144
	10	533
Aedes sollicitans Walk. -----	8	387
	10	533
Aedes spp. -----	9	422
Aedes vexans Meig. -----	5	210
	9	423
	10	533, 534
Aegeria exitiosa Say. <u>See</u> Conopia		
exitiosa (Say).		
Aegeria mellinipennis Edv. -----	3	86

<i>Aegeria pictipes</i> G. & R. -----	2	38
<i>Aeoloplus turnbullii</i> Thos. -----	5 (Sup.)	219, 221, 228, 231, 235, 237, 241, 245, 247, 249, 255
<i>Aeolothrips duvali</i> Moul. -----	10	523
<i>Aeolus dorsalis</i> Say -----	6	268
<i>Aeolus livens</i> Lec. -----	6	268
<i>Aerochoreutes carlinianus</i> Thos. -----	5 (Sup.)	231
<i>Aethalion reticulatum</i> (L.) -----	9 (Sup.)	474
<i>Agallia ingens</i> Oman -----	9 (Sup.)	456
<i>Agallia lingula</i> Van D. -----	9 (Sup.)	456
<i>Agallia modesto</i> O. & B. -----	9 (Sup.)	456
<i>Agallia novella tropicalis</i> Van D. -----	9 (Sup.)	456
<i>Agallia repleta</i> Van D. -----	9 (Sup.)	457
<i>Agellus bisinuatus</i> DeLong -----	9 (Sup.)	457
<i>Ageneotettix deorum</i> Scudd. -----	5 (Sup.)	219-259
<i>Agonoderus pallipes</i> F. -----	3	64
<i>Agrilus anxius</i> Gory -----	2	47
<i>Agrilus bilineatus</i> Web. -----	8	382
<i>Agrilus communis rubicola</i> Perrin -----	7	350
<i>Agrilus difficilis</i> Gory -----	3	86
	7	345
<i>Agrilus ruficollis</i> F. -----	9	422
<i>Agromyza simplex</i> Loew -----	5	193
<i>Agrotis c-nigrum</i> L. -----	4	99
<i>Agrotis ypsilon</i> Rott. -----	2	29
	4	100
	5	164, 165
<i>Alabama argillacea</i> Hbn. -----	4	97, 134
	5	197
	6	262, 294
	7	314, 339-341
	8	355, 364-365, 377, 378-380
	9	393, 413
	10	521-522
<i>Alchisme grossa</i> (Fairm.) -----	9 (Sup.)	475
<i>Aleurocanthus woglumi</i> Ashby -----	9 (Sup.)	454
<i>Aleuroplatus oculireniformis</i> Quaint. & Baker -----	9 (Sup.)	454
<i>Aleurothrixus howardi</i> (Quaint.) -----	9 (Sup.)	454
<i>Aligia modesta</i> O. & B. -----	9 (Sup.)	456
<i>Allochroma sexmaculatum</i> Clark -----	9 (Sup.)	439
<i>Allocoris elegans</i> McA. & M. -----	9 (Sup.)	480
<i>Alobates pennsylvanica</i> Deg. -----	9	426
<i>Alphitobius piceus</i> Oliv. -----	9	426
<i>Alsophila pomataria</i> Harr. -----	2	28, 46
	3	84
	4	135
	5	199, 200
	6	297
<i>Altica ambiens alni</i> Harr. -----	8	385-386
	10	536
<i>Altica amethystina</i> Oliv. -----	9 (Sup.)	439



<i>Altica bimarginata</i> Say -----	7	314,348
	10	536
<i>Anastris obtegens</i> (F.) -----	9 (Sup.)	475
<i>Amblyomma americanum</i> L. -----	3	90
<i>Amblyomma maculatum</i> Koch -----	5	211
	7	354
<i>Amphibolips racemaria</i> Asm. -----	8	383
<i>Amphitornus bicolor</i> Thos. -----	5 (Sup.)	311, 231.
		241, 245, 255
<i>Amphitornus coloradus</i> (Thos.) -----	5 (Sup.)	233, 247
<i>Anabrus simplex</i> Hald. -----	3	57, 59
	4	95, 99
	5	164
	6	266-287
	7	313, 318-319
	8	357
	10	516
<i>Anacentrinus subnudus</i> Buchanan -----	1	8
<i>Anaphes anomocerus</i> Girault -----	10	536
<i>Anaphes iole</i> Girault -----	10	536
<i>Anarsia lineatella</i> Zell. -----	3	71
	4	118
	7	328
	8	365
<i>Anasa andresii</i> (Guer.) -----	9 (Sup.)	480
<i>Anasa bellator</i> (F.) -----	9 (Sup.)	480
<i>Anasa madida</i> Dist. -----	9 (Sup.)	480
<i>Anasa scorbutica</i> (F.) -----	9 (Sup.)	480
<i>Anasa tristis</i> Deg. -----	3	82
	4	131
	5	192
	6	262, 290-291
	7	334
	8	373-374
	9	411
<i>Anastrepha fraterculus</i> auct. -----	1	11
<i>Anastrepha ludens</i> Loew -----	1	11
	3	75
	10	520
<i>Anastrepha pallens</i> Coq. -----	1	11
	3	75
<i>Anastrepha serpentina</i> Wied. -----	1	11
	9 (Sup.)	452
<i>Anastrepha</i> sp. "Y" -----	1	11
	3	75
<i>Ancylis comptana</i> Froel. -----	4	132
	5	158, 194
	6	292
	9	411-412
<i>Andricus punctatus</i> Bass. -----	4	139
<i>Anisota rubicunda</i> F. -----	6	298
<i>Anomala orientalis</i> Wtrh. -----	4	103
	9	419
	10	530

<i>Anopheles maculipennis</i> Meig. -----	7	351
	10	534
<i>Anopheles punctipennis</i> Say -----	7	351
<i>Anticarsia ascheltinus</i> Champ. -----	9 (Sup.)	438
<i>Anthidium</i> sp. -----	4	118
<i>Anthonomus eugenii</i> Cano -----	1	17
	4	132
	6	292
	7	335
<i>Anthonomus grandis</i> Boh. -----	1	5,17-18
	2	28,45
	3	83
	4	97,133-134
	5	196-197
	6	262,293-294
	7	313,336-337
	8	355,376-377
	9	413-414
	10	510,520-521
<i>Anthonomus grandis thurberiae</i> Pierce -----	9	414
<i>Anthonomus signatus</i> Say -----	4	131-132
	5	160
<i>Anthrenus scrophulariae</i> L. -----	8	390-391
	9	425
<i>Anthrenus verbasci</i> L. -----	8	390
	9	425-426
<i>Anthrenus vorax</i> Wtrh. -----	8	390
<i>Antianthe expansa</i> (Germ.) -----	9 (Sup.)	475
<i>Anticarsia gemmatilis</i> Hbn. -----	8	358
	9	397,400
<i>Anuraphis maidi-radicis</i> Forbes -----	4	134
	6	295
<i>Anuraphis roseus</i> Baker -----	1	5,9
	2	27,33
	3	66-67
	4	113-114
	5	160,178
	7	315
<i>Anychus clarkii</i> McG. -----	9	405
<i>Anypotactus exilis</i> Boh. -----	9 (Sup.)	449
<i>Apanteles</i> sp. -----	9 (Sup.)	502
<i>Apanteles thompsoni</i> Lyle -----	9 (Sup.)	502
<i>Apantesis</i> sp. -----	5	165
<i>Aphelinus mali</i> Hald. -----	3	67
<i>Aphiidae</i> -----	2	33,53
	3	57,65,82,88
	4	96
	5	178,197
	6	262,295
	9	415
<i>Aphis forbesi</i> Weed -----	1	17
	9	412
<i>Aphis gossypii</i> Glov. -----	3	84
	4	134

<i>Aphis gossypii</i> Glov. (Cont'd) -----	5	197
	6	290, 295
	7	334
	8	373
	9	410-411, 415
<i>Aphis maidis</i> Fitch -----	6	275
	7	324
<i>Aphis medicaginis</i> Koch -----	4	134
<i>Aphis nerii</i> Boyer -----	9 (Sup.)	454
<i>Aphis pomi</i> Deg. -----	2	27, 33
	3	66-67
	4	113-114
	5	160, 178
	7	315, 327
<i>Aphis rumicis</i> L. -----	4	128
	5	196
	9	422
<i>Aphis sambucifoliae</i> Fitch -----	4	142
<i>Aphis spiraecola</i> Patch -----	1	11
	2	39
	3	75
	4	143
	10	510
<i>Aphomia gularis</i> Zell. -----	3	93
<i>Approtopos melantho</i> (Bates) -----	9 (Sup.)	491
<i>Argyresthia thuiella</i> Pack. -----	5	208
	7	348
<i>Argyrotaenia velutinana</i> Walk. -----	6	304
<i>Arphia pseudonietana</i> Thos. -----	5 (Sup.)	219, 225, 226, 228, 231, 239, 241, 245, 249, 255
<i>Ascia protodice</i> Bdv. & Lec. -----	8	372
	9	409
<i>Ascia rapae</i> L. -----	1	15
	2	43
	3	80-81
	4	129-130
	5	158, 189, 190
	6	289
	7	332
	8	371-372
	9	395, 409
<i>Asphaera nobilitata</i> (F.) -----	9 (Sup.)	439
<i>Aspidiotus ancylus</i> Putn. -----	2	52
<i>Aspidiotus coniferarum</i> Ckll. -----	5	208
<i>Aspidiotus hederæ</i> Vallot -----	9	421
<i>Aspidiotus perniciosus</i> Comst. -----	1	9
	2	27, 34-35
	3	67
	4	114-115
	8	353
	9	401
	11	578
<i>Aspidosoma aegrotum</i> Gorh. -----	9 (Sup.)	447
<i>Aspidosoma laterale</i> (F.) -----	9 (Sup.)	447



Asterolecanium bambusae Boisd. -----	9 (Sup.)	468
Attelabus conicollis Sharp -----	9 (Sup.)	449
Attelabus corvinus Gyll. -----	9 (Sup.)	451
Aurochloa seminigra Ckll. -----	9 (Sup.)	489
Aulacaspis pentagona Targ. -----	3	88, 94
	9	419
	9 (Sup.)	468
Aulacizes panamensis Fowl. -----	9 (Sup.)	457
Aulocara ellioti Thos. -----	5	163
	5 (Sup.)	219, 221, 228, 231, 233, 235, 237, 241, 243, 245, 247, 249, 255, 257, 259
	6	264
	7	318
Aulocara femoratum Scudd. -----	5 (Sup.)	258
Autographa brassicae Riley -----	1	15
	2	44
	3	81
	4	130
	5	189, 190
	7	333
	8	372
	9	409-410
Autographa californica Speyer -----	1	8
	3	81
Automeris boucardi Druce -----	9 (Sup.)	491
Autoserica castanea Arrow -----	4	103
	7	321
	8	359
	10	530
Baeus sp. -----	10	536
Baris aerea (Boh.) -----	9 (Sup.)	450
Bathyplectes curculionis Thoms. -----	1	5, 7
	2	32
	3	64-65
	4	108
	5	173
Bembicia marginata Harr. -----	7	328
Bephrata maculicollis Cam. -----	9 (Sup.)	489
Bertholdia specularis (H. S.) -----	9 (Sup.)	491
Biorhiza forticornis Walsh -----	8	383
Blapstinus rufipes Csy. -----	3	93
Blapstinus sonorae Csy. -----	5	198
Blapstinus sulcatus Lec. -----	3	93
Blissus hirtus Montd. -----	5	171
	6	273
	7	325
	9	418
Blissus leucopterus Say -----	1	6-7
	1 (Sup.)	25
	2	27, 30-31
	3	57, 62-63
	4	95, 104-106

Blissus leucopterus Say (Cont'd) -----	5	157,169-171
	6	261,272-273
	7	323
	8	388,391-392
	9	393,398-399
	10	510,513-514
Blissus occiduus Barber -----	5	160
Bolbonota inaequalis (Fairm.) -----	9 (Sup.)	475
Bolbonota insignis Fowl. -----	9 (Sup.)	475-476
Boopeton nutilum Say -----	5 (Sup.)	219,231,238,245
Bothriocera tinealis (Klug) -----	9 (Sup.)	471
Brachyrhinus sulcatus F. -----	5	209
Brachystola magna Gir. -----	5 (Sup.)	219,222,223,235, 245,255
Bracon aticornis (Smith) -----	9 (Sup.)	502
Brentus mexicanus Boh. -----	9 (Sup.)	433
Brevicoryne brassicae L. -----	1	16
	2	28,43
	3	56,61
	4	130
	5	190
	6	289
	7	333
	9	410
Bruchebdus mayri (Masi) -----	10	518
Bruchus brachialis Fahraeus -----	6	275
	10	518
Bruchus pisorum L. -----	1	23
	3	93
	4	148
	5	212
Bruneria brunnea Thos. -----	5 (Sup.)	231,255
Bryobia praetiosa Koch -----	2	37
	3	72
Bucculatrix canadensisella Chamb. -----	8	382
Bucculatrix thurberiella Busck -----	2	381
Bystus hemisphaericus (Gerst.) -----	9 (Sup.)	417
Byturus unicolor Say -----	6	280
	7	328
Cacoecia argyrospila Walk. -----	4	113
	5	177
Cacoecia cerasivorana Fitch -----	5	182-183
Cacoecia fumiferana Clem. -----	6	303
	7	347
Cacoecia rosaceana Harr. -----	4	143
Calendra maidis Chitt. -----	4	107
Calendra spp. -----	4	107
	5	169
Caliroa aethiops F. -----	4	143
	5	209
	6	305
Callichroma holochlora Bates -----	9 (Sup.)	439
Calligrapha elegantula Jacoby -----	9 (Sup.)	439
Callosobruchus maculatus F. -----	9	395

<i>Calomycterus setarius</i> Roelofs -----	5	207
	6	261, 270
	10	525
<i>Calosoma willcoxi</i> Lec. -----	5	199
<i>Camula pellucida</i> Scudd. -----	5	131, 163
	5 (Sup.)	219, 259
	6	263, 264
	9	396
<i>Camponotus herculeanus pennsylvanicus</i> Deg. -----	5	212
	6	308
	7	352
	8	390
<i>Campoplex multicinctus</i> Grav. -----	9 (Sup.)	502
<i>Campoplex pyraustae</i> Grav. -----	9 (Sup.)	502
<i>Camptoprosopella zanthoptera</i> Hendel -----	9 (Sup.)	452
<i>Campylocentrus hamifer</i> (Fairm.) -----	9 (Sup.)	476
<i>Campylocentrus pusillus</i> (Fairm.) -----	9 (Sup.)	476
<i>Canthon viridis</i> (Beauv.) -----	9 (Sup.)	448
<i>Capitophorus fragaefolii</i> Ckll. -----	2	44
<i>Carneocephala sagittifera</i> Uhl. -----	9 (Sup.)	457
<i>Carpocapsa pomonella</i> L. -----	1	9
	2	27, 35-36
	3	58, 67-68
	4	96, 111-112
	5	158, 160, 175-177
	6	261, 276-277
	7	313, 326
	8	333-364
	9	393, 395, 401
	10	509, 518
<i>Carpolonchaea pendula</i> Bezzi -----	9 (Sup.)	452
<i>Carpophilus dimidiatus</i> F. -----	8	391
	9	426
<i>Carpophilus hemipterus</i> L. -----	3	93
	8	391
<i>Carpophilus marginatus</i> Er. -----	8	367
<i>Carpophilus pallipennis</i> Say -----	6	304
<i>Castolus plagiaticollis</i> Stal -----	9 (Sup.)	480
<i>Catopsilia eubule</i> L. -----	9	397
<i>Cebrinus modesta</i> Dist. -----	9 (Sup.)	480
<i>Cecidomyia poculum</i> O. S. -----	7	346
<i>Cecidomyia verrucicola</i> O. S. -----	6	300
	7	345
<i>Cephenomyia pratti</i> Hunter -----	3	90
<i>Cephus siccifolius</i> (Walk.) -----	9 (Sup.)	455
<i>Cephus cinctus</i> Nort. -----	7	314
	8	355
	9	394
<i>Cephus pygmaeus</i> L. -----	6	272
	8	360
<i>Cerataphis lataniae</i> (Boisd.) -----	9 (Sup.)	454
<i>Ceratomegilla fuscilabris</i> Muls. -----	4	125
<i>Ceratonia catalpae</i> Bdv. -----	4	137-138
	6	298-299



Cercopidae -----	4	19
Ceresa bubalus F. -----	7	327
Ceresa testacea Fairm. -----	9 (Sup.)	473
Ceresa vitulus (F.) -----	9 (Sup.)	476
Ceresa vitulus minor Fowl. -----	9 (Sup.)	476
Ceroplastes floridensis Comst. -----	9 (Sup.)	487
Cerostoma xylostella L. -----	6	304
Cerotoma rogersi Jacoby -----	9 (Sup.)	440
Cerotoma salvini Baly -----	9 (Sup.)	440
Cerotoma trifurcata Forst. -----	1	14
	3	8
	4	128
	7	332
Ceutorhynchus assimilis Payk. -----	5	191
	6	262, 289
Ceutorhynchus rapae Gyll. -----	4	131
Chaetocnema ectypa Horn -----	8	362
Chaetocnema pulicaria Melsh. -----	3	34
	4	108
Chalcodermus aeneus Boh. -----	4	110
Chalcoides helxines L. -----	4	117
Chariesterus moestus Burm. -----	9 (Sup.)	480
Chauliognathus histrio (Dej.) -----	9 (Sup.)	488
Chelonus annulipes Wesm. -----	9 (Sup.)	500, 501, 502
Chermes abietis L. -----	2	42
Chilo sp. -----	1	24
Chilocorus bivulnerus Muls. -----	2	34
Chilocorus cacti L. -----	9 (Sup.)	468
Chionaspis euonymi Comst. -----	1	18
	2	52
	5	203
	7	349
	8	386
	9	421
Chionaspis pinifoliae Fitch -----	2	42-49
	3	27
	4	140
	5	203
	7	343
	8	383
	9	417-418
Chionaspis salicis-nigrae Walsh -----	4	141
Chirida guttata Oliv. -----	5	196
	9 (Sup.)	440
Chiriquia serrata Morse -----	9 (Sup.)	434
Chloealtis conspersa Harr. -----	5 (Sup.)	224
Chlorochroa sayi Stal -----	7	313, 321
	9	395
Chlorion laeviventris Cress. -----	8	357
Chlorippe celtis Bdv. & Lec. -----	8	367
Chorisoneura gemmicula Hebard -----	9 (Sup.)	494
Chlorocoris aberrans Dist. -----	9 (Sup.)	480
Chorizagrotis auxiliaris Grote -----	2	29
	3	37, 59

Chorizagrotis auxiliaris Grote (Cont'd) ----	4	100
	5	164
Chortippus curtipennis Harr. -----	5 (Sup.)	219-255
Chortophaga australior R. & H. -----	5 (Sup.)	223
Chrysobothris femorata Oliv. -----	2	36-37
	3	70
	4	115
	5	174
	7	327
	9	400
Chrysomphalus aonidum L. -----	2	39
	9	393,404
Chrysomphalus aurantii Mask. -----	1	5,11
	2	39
	4	122
	6	281-282
	9	404
Chrysomphalus dictyospermi (Morg.) -----	9 (Sup.)	469
Chrysomphalus obscurus Comst. -----	1	10
	4	121
	5	205
Chrysomphalus tenebricosus Comst. -----	4	139
Chrysops flavidus Wied. -----	5	211
Chrysops plangens Wied. -----	5	211
Chrysops variegata Deg. -----	9 (Sup.)	452
Cicadella anita Fowl. -----	9 (Sup.)	457
Cicadella areolata Sign. -----	9 (Sup.)	457
Cicadella coeruleovittata Sign. -----	9 (Sup.)	458
Cicadella costaricensis Dist. -----	9 (Sup.)	458
Cicadella lativittata Fowl. -----	9 (Sup.)	458
Cicadella lutea Sign. -----	9 (Sup.)	458
Cicadella miniaticeps Fowl. -----	9 (Sup.)	458-459
Cicadella mollicella Fowl. -----	9 (Sup.)	459
Cicadella occatoria (Say) -----	9 (Sup.)	459
Cicadella pardalina Fowl. -----	9 (Sup.)	460
Cicadella pulchella Guer. -----	9 (Sup.)	460
Cicadella reservata Fowl. -----	9 (Sup.)	460
Cicadella rufoapicata Fowl. -----	9 (Sup.)	460
Cicadella satellas Fowl. -----	9 (Sup.)	460
Cicadella sexlineata Sign. -----	9 (Sup.)	460-461
Cicadella similis Walk. -----	9 (Sup.)	461
Cicadella testudinaria Fowl. -----	9 (Sup.)	462
Cicadellidae -----	3	65
	8	364
Cicadula maidis DeLong & Wolcott -----	9 (Sup.)	462
Cimex lectularius L. -----	4	144
	6	306
Cimex pilosellus Horv. -----	4	144
	8	388
Cinara strobi Fitch -----	2	48
	9	417
Cincticornia pilulae Walsh -----	8	383
Cingilia catenaria Drury -----	8	382
Circotettix rabula R. & H. -----	5 (Sup.)	219

<i>Cirphis unipuncta</i> Haw. -----	4	101
	5	165
	6	267
	7	319
<i>Clastoptera funesta</i> Stal -----	9 (Sup.)	455
<i>Clastoptera obtusa</i> Say -----	3	75
	9 (Sup.)	455
<i>Clausonia purpurea</i> Ishii -----	10	533
<i>Cleistolophus similis</i> (Chevr.) -----	9 (Sup.)	450
<i>Coccimorphus dichorus</i> Lac. -----	9 (Sup.)	447
<i>Cocconotus rarus</i> Rehn -----	9 (Sup.)	494
<i>Coccophagus gurneyi</i> Compere -----	1	11
<i>Coccus acuminatus</i> (Sign.) -----	9 (Sup.)	469
<i>Coccus hesperidum</i> (L.) -----	9 (Sup.)	469
<i>Coccus viridis</i> (Green) -----	9 (Sup.)	469
<i>Cochliomyia americana</i> C. & P. -----	1	21
	2	28,53
	3	89
	4	145
	5	211
	6	262,307
	7	333
	8	389
	9	393,424
	10	532-533
<i>Cochliomyia</i> spp. -----	1	5,21
<i>Colaspis fulvotestacea</i> Lef. -----	9 (Sup.)	440
<i>Colaspis prasina</i> Lef. -----	9 (Sup.)	440
<i>Colaspis sculpta</i> Jacoby -----	9 (Sup.)	440
<i>Colaspis</i> sp. -----	9	414
<i>Colaspis submetallica</i> Jacoby -----	9 (Sup.)	440
<i>Coleophora loricella</i> Hbn. -----	3	86
	4	159
	5	204
<i>Coleophora pruniella</i> Clem. -----	3	72
<i>Colgorma proxima</i> (Fowl.) -----	9 (Sup.)	471
<i>Collaria oleosa</i> Dist. -----	9 (Sup.)	481
<i>Collembola</i> -----	8	392
<i>Colopha ulmicola</i> Fitch -----	6	300
	3	333
<i>Colpoptera sinuata</i> Burm. -----	9 (Sup.)	472
<i>Colpoptera</i> sp. -----	9 (Sup.)	472
<i>Coninomus constrictus</i> Gyll. -----	9	427
<i>Concephalus cinereus</i> Thunb. -----	9 (Sup.)	494
<i>Conopia exitiosa</i> Say -----	1	9
	4	118
	5	181
	7	315,323
	8	365
	9	402
<i>Conotelus mexicanus</i> Murr. -----	9 (Sup.)	447
<i>Conotelus stenoides</i> Murr. -----	9 (Sup.)	448
<i>Conotrachelus affinis</i> Boh. -----	7	322
<i>Conotrachelus crataegi</i> Walsh -----	9	421



<i>Conotrachelus fulvessens</i> Champ. -----	2 (Sup.)	450
<i>Conotrachelus nemuphar</i> Hbst. -----	1	9
	2	27, 37 -38
	3	70 -71
	4	96, 116-117
	5	158, 179-180
	6	278
	7	315, 328
	8	365
	10	519
<i>Conotrachelus perseae</i> Barber-----	9 (Sup.)	450
<i>Conotrachelus signatus</i> Kirsch. -----	9 (Sup.)	450
<i>Contarinia pyrivora</i> Riley -----	3	72
<i>Contarinia tritici</i> Kby. -----	7	315
	8	355
<i>Copicerus irroratus</i> Swartz -----	9 (Sup.)	472
<i>Copturus perseae</i> Ganth. -----	9 (Sup.)	450
<i>Cordillacris cremulata</i> Brun. -----	5 (Sup.)	230, 231, 233, 241, 245, 255, 259
		219, 245
<i>Cordillacris occipitalis</i> Thos. -----	5 (Sup.)	481
<i>Corecoris fusca</i> (Thunb.) -----	9 (Sup.)	481
<i>Corizus hyalinus</i> (F.) -----	9 (Sup.)	481
<i>Corizus pictipes</i> (Stal) -----	9 (Sup.)	481
<i>Corizus sidae</i> F. -----	9 (Sup.)	481
<i>Corythucha ciliata</i> Say -----	2	49
	3	413
<i>Corythucha cydoniae</i> Fitch -----	7	348
	8	385
<i>Corythucha</i> spp. -----	8	384
<i>Cosmopepla coeruleata</i> Montd. -----	9 (Sup.)	481
<i>Cotinis nitida</i> L. -----	6	268
	8	351
	9	419
<i>Cotyleceps maculata</i> Fowl. -----	9 (Sup.)	473
<i>Crambus caliginosellus</i> Clem. -----	6	274
<i>Crambus</i> spp. -----	4	96, 107
	5	172
	7	325
	8	385
<i>Cratypedes neglectus</i> Thos. -----	5 (Sup.)	219, 221, 255, 258.
<i>Croceastus flavorbitalis</i> (Cameron)-----	9 (Sup.)	499, 501, 502, 505.
<i>Creontiades rubrinervus</i> (Stal) -----	9 (Sup.)	481
<i>Crioceris asparagi</i> L. -----	3	82
	5	193
	6	291
<i>Cryptocephalus trizonatus</i> Suffr. -----	9 (Sup.)	440-441
<i>Cryptococcus fagi</i> Baer. -----	5	202
	6	293
	7	343
	8	382
	9	416
<i>Cryptolaemus montrouzieri</i> Muls. -----	1	11

<i>Cryptorhynchus lapathi</i> L. -----	7	347
<i>Cryptotermes brevis</i> Walk. -----	1	24
<i>Cryptotermes cavifrons</i> Banks -----	1	24
<i>Ctenocephalides canis</i> Curt. -----	8	388
	9	423
<i>Ctenocephalides felis</i> Bouche -----	9	423
<i>Ctenocephalides</i> spp. -----	9	423
<i>Ctenochira curulata</i> (Boh.) -----	9 (Sup.)	441
<i>Ctenochira vivida</i> (Boh.) -----	9 (Sup.)	441
<i>Culex pipiens</i> L. -----	8	387
	10	533, 534
<i>Culicinae</i> -----	4	144
	5	210
	6	305
	9	422-423
<i>Culicoides canithorax</i> Hoffm. -----	4	144
	5	210
	7	351
	9	424
<i>Culicoides dovei</i> Hall -----	5	210
	7	351
<i>Culicoides melleus</i> Coq. -----	5	210
<i>Culicoides</i> spp. -----	4	144-145
	6	305
	7	351
	9	424
<i>Curculio caryae</i> Horn -----	7	329
	9	403
<i>Cyclocephala mafaffa</i> Burn. -----	9 (Sup.)	448
<i>Cylas formicarius</i> F. -----	1	10
	8	375
	9	412
<i>Cyllene robiniae</i> Forst. -----	4	139
<i>Cypherotylus elevatus</i> (F.) -----	9 (Sup.)	447
<i>Cyphonia clavata</i> (F.) -----	9 (Sup.)	476
<i>Cyrtocapsus caligineus</i> (Stal) -----	9 (Sup.)	481
<i>Dactylotum pictum</i> Thos. -----	9 (Sup.)	213, 241
<i>Danaus menippe</i> Hbr. -----	2	25
<i>Dasyneura rhodophaga</i> Coq. -----	9	441-442
<i>Dasyneura ulmea</i> Felt -----	4	138
<i>Datana integerrima</i> G. & R. -----	6	262, 281
	7	342
	8	366
<i>Datana</i> sp. -----	6	298
<i>Debilis angustata</i> Champ. -----	9 (Sup.)	481
<i>Delphacodes nigra</i> Crawford -----	9 (Sup.)	473
<i>Delphacodes nigrifacies</i> Muir -----	9 (Sup.)	473
<i>Delphacodes propinqua</i> Fieb. -----	9 (Sup.)	473
<i>Deltoccephalus flavicosta</i> Stal -----	9 (Sup.)	462
<i>Deltoccephalus spinosus</i> Gibson -----	9 (Sup.)	462
<i>Demodex folliculorum</i> Simon -----	4	147
<i>Dendroctonus frontalis</i> Zimm. -----	4	14
	5	25

<i>Dendroctonus piceaporda</i> Hopk. -----	8	355,384
	9	393,418
<i>Dermacenter andersoni</i> Stiles -----	4	145
	6	302
	10	534
<i>Dermacenter variabilis</i> Say -----	3	90
	4	97,145
	5	210
	6	262,306
	7	352
	8	388
	10	535
<i>Dermacenter venustus</i> Marx.		
See <i>D. andersoni</i> Stiles.		
<i>Dermatobia hominis</i> (L.) -----	3 (Sup.)	452
<i>Dermestes cadaverinus</i> F. -----	8	391
<i>Dermestes lardarius</i> L. -----	4	148
<i>Dermestes vulpinus</i> F. -----	9	426
<i>Derocrepis erythropus</i> Melsh. -----	7	328
<i>Derotoma haydenii</i> Thos. -----	5 (Sup.)	219,221,231,235,236, 241,243,245,247,255
<i>Desmia funeralis</i> Hbn. -----	3	73
	4	119
	9	403
<i>Diabrotica balteata</i> Lec. -----	1	5,13
	2	42
	7	333
	9 (Sup.)	441
<i>Diabrotica duodecimpunctata</i> F. -----	1	13
	2	41
	3	77
	4	96,106,124-125
	8	368
	9	403
<i>Diabrotica fulvicornis</i> Jacoby -----	9 (Sup.)	441
<i>Diabrotica fulvosignata</i> Baly -----	9 (Sup.)	441
<i>Diabrotica longicornis</i> Say -----	7	325
<i>Diabrotica nummularis</i> Harold -----	9 (Sup.)	442
<i>Diabrotica porracea</i> Harold -----	9 (Sup.)	442
<i>Diabrotica soror</i> Lec. -----	4	125
	5	180
	6	283
	7	333
<i>Diabrotica</i> sp. -----	7	333
<i>Diabrotica theimei</i> Baly -----	9 (Sup.)	442
<i>Diabrotica trivittata</i> Mann. -----	7	333
<i>Diabrotica viridula</i> (F.) -----	9 (Sup.)	442
<i>Diabrotica vittata</i> F. -----	3	77
	4	124
	5	191
	8	368
	9	406
	9 (Sup.)	443
<i>Diacrisia virginica</i> F. -----	5	185
	8	375



<i>Dialeurodes chittendeni</i> Laing -----	1	19
<i>Dialeurodes citri</i> Ashm. -----	2	7
	3	75
	4	122
	7	329
	8	327
	9	403
<i>Dialeurodes citrifolii</i> Morg. -----	7	329
	8	367
	9	404
<i>Diaphania hyalinata</i> L. -----	5	151
	8	373
<i>Diaphania nitidalis</i> Stoll. -----	5	192
	8	373
	9 (Sup.)	401
<i>Diatraea grandiosella</i> Dyar -----	9	400
<i>Diatraea saccharalis</i> F. -----	1	8
	3	65
<i>Dicentria sabella</i> Druce -----	9 (Sup.)	491
<i>Dicentria violascens</i> (H. S.) -----	9 (Sup.)	491
<i>Dichromia dimidiata</i> Burm. -----	7	341 - 342
<i>Dichomeris marginellus</i> F. -----	3	88
	4	142
<i>Dictyophara herbida</i> (Walk.) -----	9 (Sup.)	473
<i>Dictyophara obtusifrons</i> (Walk.) -----	9 (Sup.)	473
<i>Dicyphus minimus</i> Uhl. -----	7	336
<i>Dikraneura kunzei</i> Gill. -----	2	51
<i>Dilachmus strobilifera</i> Fitch.		
See <i>Cinara strobilifera</i> Fitch.		
<i>Dilephus melanarius</i> V. d. Walp. -----	9 (Sup.)	453
<i>Dione vanillae</i> L. -----	9	397
<i>Diplosis inopis</i> O. S. -----	3	27
<i>Diplotaxis atlantis</i> Fall -----	4	132
<i>Diplotaxis</i> sp. -----	4	137
<i>Diprion polytomum</i> Htg. -----	5	207
	6	363
	8	384 - 385
	9	385, 413
<i>Diprion frutetorum</i> F. -----	5	120
<i>Diprion swaini</i> Middleton -----	5	120
<i>Dissosteira carolina</i> L. -----	5	127
	5 (Sup.)	219 - 253
	6	264, 265
	7	318
	8	352
<i>Dissosteira longipennis</i> Thos. -----	5 (Sup.)	219, 221, 245
	6	265
	8	356
	9	356 - 357
	10	313
<i>Dissosteira spicifera</i> Sauss. -----	5 (Sup.)	242, 253
<i>Disorycha triangularis</i> Say -----	5	124
<i>Disorycha trifasciata</i> Clark -----	5 (Sup.)	443
<i>Dorymyrmex pyramicus</i> Roger -----	6	366
<i>Doryphorophaga doryphorae</i> Riley -----	6	284

<i>Draeculacephala lenticula</i> Ball -----	9 (Sup.)	462
<i>Draeculacephala soluta</i> Gibs. -----	9 (Sup.)	462
<i>Draconaria</i> sp. -----	5	166
<i>Drepanopterna femoratum</i> Scudd. -----	5 (Sup.)	219-259
<i>Dysdercus flavolimbatus</i> Stal -----	9 (Sup.)	481
<i>Dysdercus mimulus</i> Hussey -----	9 (Sup.)	482
<i>Dysdercus obliquus</i> (H. S.) -----	9 (Sup.)	482
<i>Dysdercus oncopeltus</i> Dist. -----	9 (Sup.)	482
<i>Eantis pallida</i> (Feld.) -----	9 (Sup.)	491
<i>Eburia quadrigeminata</i> Say -----	8	391
<i>Eccritotarsus pallidirostris</i> Stal -----	9 (Sup.)	482
<i>Ecdytolopha insiticiaria</i> Zell. -----	6	300
<i>Ectatomma ruidum</i> Roger -----	9 (Sup.)	489
<i>Edessa cornuta</i> Burm. -----	9 (Sup.)	482
<i>Edessa junia</i> Stal -----	9 (Sup.)	482
<i>Edessa nigrispina</i> Dallas -----	9 (Sup.)	482
<i>Edessa rufomarginata</i> (Deg.) -----	9 (Sup.)	482
<i>Elasmopalpus lignosellus</i> Zell. -----	4	107
	6	274
	7	332
	8	374- 375
<i>Elateridae</i> -----	3	57 ,60
	4	95,101 -102
	5	157,159,165 -166
	9	394,408
<i>Eleodes opaca</i> Say -----	3	63
<i>Eleodes</i> sp. -----	5	173
<i>Eleodes</i> spp. -----	3	63
<i>Eleodes suturalis</i> Say -----	3	63
	8	391
<i>Ellipes minuta</i> (Scudd.) -----	9 (Sup.)	494
<i>Ellopiia fiscellaria</i> Guen. -----	9	393, 416
<i>Empoasca fabae</i> Harr. -----	6	285
	8	370
	9	408, 421
<i>Empoasca filamenta</i> DeLong -----	6	285
	8	370
<i>Empoasca perelegans</i> Oman -----	9 (Sup.)	463
<i>Empoasca phaseola</i> Oman -----	9 (Sup.)	463
<i>Empoasca solana</i> DeLong -----	9	408
<i>Enchenopa binotata</i> Say -----	9	422
	9 (Sup.)	476 -477
<i>Enchenopa lanceolata</i> (Stoll) -----	9 (Sup.)	477
<i>Enechophyllum dubium</i> Fowl. -----	9 (Sup.)	477
<i>Encoptolophus costalis</i> Scudd -----	5 (Sup.)	219 -259
<i>Encoptolophus sordidus</i> Burm. -----	5 (Sup.)	223,225,226
<i>Ennomos subsignarius</i> Hbn. -----	4	135
<i>Enoclerus villicus</i> (Gorh.) -----	9 (Sup.)	446
<i>Entomoscelis adonidis</i> Pallas -----	5	160
	7	315
<i>Entylia sinuata</i> (F.) -----	9 (Sup.)	477
<i>Ephestia figulilella</i> Greg. -----	3	92 -93
<i>Ephestioides nigrella</i> Hulst -----	3	93
<i>Epibidis godmani</i> Fowl. -----	9 (Sup.)	473

<i>Epicoeris imbricatus</i> Say -----	5	173
<i>Epicauta cinerea</i> Forst. -----	8	368
<i>Epicauta lemniscata</i> F. -----	7	330
	8	368
<i>Epicauta maculata</i> Say -----	6	283
	7	330
<i>Epicauta marginata</i> F. -----	8	368
<i>Epicauta pennsylvanica</i> Deg. -----	6	282, 283
	8	368
	9	421
<i>Epicauta</i> sp. -----	5	185
	6	283
<i>Epicauta</i> spp. -----	7	330
<i>Epicauta vittata</i> F. -----	4	125
	6	282
<i>Epicranion championi</i> Fowl. -----	9 (Sup.)	455
<i>Epilachna abrupta</i> Gorb. -----	9 (Sup.)	446
<i>Epilachna borealis</i> F. -----	8	374
	9 (Sup.)	446
<i>Epilachna defecta</i> Muls. -----	9 (Sup.)	446
<i>Epilachna varivestis</i> Muls. -----	2	28, 42
	3	79-80
	4	96, 127-128
	5	158, 187-188
	6	287-288
	7	332
	8	370-371
	9 (Sup.)	446
	10	510, 524
<i>Epilachna virgata</i> Muls. -----	9 (Sup.)	446
<i>Epitrix cucumeris</i> Harr. -----	3	78
	4	127
	5	186
	6	284-285
	7	331
	9	370
<i>Epitrix fuscata</i> (Duv.) -----	9 (Sup.)	443
<i>Epitrix parvula</i> F. -----	3	78
	4	127
	6	284
	7	313, 335
	9	408, 412
	10	509
<i>Epitrix subscrinata</i> Lec. -----	5	186
	6	285
<i>Erannis tiliaria</i> Harr. -----	4	128
	6	297
<i>Erechtia sallaei</i> (Fowl.) -----	9 (Sup.)	447
<i>Eriococcus araucariae</i> Mask. -----	9 (Sup.)	447
<i>Eriococcus azaleae</i> Const. -----	7	313
	4	142



<i>Eriolus longipennis</i> Redt. -----	9 (Sup.)	434
<i>Eriophyes gossypii</i> Banks -----	3	84
<i>Eriophyes</i> sp. -----	5	208
<i>Eriosoma americanum</i> Riley -----	5	203
<i>Eriosoma lanigerum</i> Hausm. -----	3	67
<i>Erythraeus gracilis</i> (How.) -----	10	536
<i>Erythrastides pygmaea</i> Say -----	7	329
<i>Erythroneura comes</i> Say -----	1	10
	2	34, 38
	4	114, 120
	6	262, 280
	7	315-316
<i>Erythroneura comes maculata</i> Gill. -----	8	364
<i>Erythroneura comes ziczac</i> Walsh -----	2	38
<i>Erythroneura elegans</i> McAtee -----	2	38
<i>Erythroneura obliqua</i> Say -----	2	34
	4	114
<i>Esthlogena porosa</i> Bates -----	9 (Sup.)	439
<i>Estigmene acraea</i> Drury -----	3	64
<i>Etiella zinckenella</i> Treit. -----	3	94
	6	289
<i>Euchaetes mitis</i> Schaus -----	9 (Sup.)	491
<i>Eucosma gloriola</i> Heinr. -----	6	302
<i>Euetheola rugiceps</i> Lec. -----	3	66
	4	96, 108
	5	157, 172
<i>Euglyphis castalia</i> (Druce) -----	9 (Sup.)	492
<i>Euglyphis melancholica</i> (Butl.) -----	9 (Sup.)	492
<i>Eulimneria alba</i> Ell. & Sacht. -----	9 (Sup.)	502
<i>Eulophus viridulus</i> Thoms. -----	9 (Sup.)	502
<i>Eumastax silvicola</i> R. & R. -----	9 (Sup.)	494
<i>Euphyllodromia angustata</i> (Latr.) -----	9 (Sup.)	495
<i>Euproctus subdeletus</i> Bates -----	9 (Sup.)	438
<i>Eurhinus festivus</i> (F.) -----	9 (Sup.)	450
<i>Eurymus eurytheme</i> Bdv. -----	8	355, 362
<i>Euryophthalmus cinctus</i> (H. S.) -----	9 (Sup.)	483
<i>Euscelis striatulus</i> Fall. -----	6	281
<i>Euschausia argentata</i> Pack. -----	6	302
<i>Euschistus bifibulus</i> (Beauv.) -----	9 (Sup.)	483
<i>Euschistus crenator</i> (F.) -----	9 (Sup.)	483
<i>Eusimulium pecuarum</i> Riley -----	2	54
<i>Eusimulium</i> spp. -----	2	54
<i>Eutettix tenellus</i> Bak. -----	2	44
	3	82
	4	96, 133
	7	335
	8	375
	9	411
	10	524
<i>Eutrombidium trigonum</i> Hermann -----	6	265
<i>Euxesta stigmatias</i> Loew -----	1	24
<i>Euxoa excellens</i> Grote -----	5	193
<i>Euxoa messoria</i> Harr. -----	5	165
<i>Euxoa</i> sp. -----	4	99

<i>Exeristes roborator</i> F. -----	9 (Sup.)	451
<i>Exitianus picatus</i> Gibs. -----	9 (Sup.)	454
<i>Exophthalmus jekeliani</i> (White) -----	9 (Sup.)	455
<i>Exophthalmus scalptus</i> Champ. -----	9 (Sup.)	456
<i>Exophthalmus sulcicrus</i> Champ. -----	9 (Sup.)	451
<i>Fenusa pumila</i> Klug -----	4	157
	7	343
<i>Fidia viticida</i> Walsh -----	4	120
	5	183
<i>Fiorinia theae</i> Green -----	9	429
<i>Flatoides humeralis</i> Walk. -----	9 (Sup.)	474
<i>Furia olivacea</i> Rohw. -----	1	14
<i>Forficula auricularia</i> L. -----	6	267
	7	315
	8	357
<i>Formica exsectoides</i> Forel. -----	9	389
<i>Formica fusca</i> Hinds -----	5	212
	6	309
<i>Formicidae</i> -----	1	20
	3	92
	4	148
	8	389 - 390
<i>Frankliniella fusca</i> Hinds -----	4	135
	10	523
<i>Frankliniella gossypii</i> Morg. -----	10	523
<i>Frankliniella minuta</i> Moul. -----	2	37
<i>Frankliniella occidentalis</i> Perg. -----	5	174
	10	523
<i>Frankliniella runneri</i> Morg. -----	10	523
<i>Frankliniella</i> sp. -----	4	122
<i>Frankliniella tritici</i> Fitch -----	2	40
	3	75
	4	110, 135
	10	523
<i>Frankliniella tritici californicus</i> Moul. -----	1	12
	2	37
<i>Fundella cistipennis</i> Dyar -----	3	94
<i>Gaetulia plenipennis</i> (Walk.) -----	9 (Sup.)	475
<i>Galeruca encaustica</i> Germ. -----	9 (Sup.)	476
<i>Galerucella cavicolis</i> Lec. -----	4	119
	5	143
<i>Galerucella nymphaeae</i> L. -----	7	350
<i>Galerucella xanthomelana</i> Schr. -----	3	46
	4	135
	5	159, 202
	6	201
	7	344
	8	382
	9	417
<i>Gargaphia patricia</i> (Stal) -----	9 (Sup.)	453
<i>Gargaphia solanii</i> Heid. -----	6	291
	2	374
<i>Gastroidea aenea</i> Melsh. -----	5	174
<i>Gastrophilus intestinalis</i> Deg. -----	3	459
	9	460

Gastrophilus spp. -----	9		425
G. stridac -----	3		84
	4		97, 135
	5	158-159, 199-200	
	6		297
	10		528
Geraeus lentiginosus (Boh.) -----	9 (Sup.)		451
Geraeus lineellus (Lec.) -----	9 (Sup.)		451
Geraeus scillis (Gyll.) -----	9 (Sup.)		451
Gloveria balloui Schaus -----	9 (Sup.)		492
Glyptoscelis pubescens F. -----	7		346
Glyptoscelis squamulata Crotch -----	3		73
Gnorimoschema chenopodiella Busck -----	4		132
Gnorimoschema lycopersicella Busck -----	3	58, 79	
	4		127
	5		187
	6		286
	7		331
	8		370
	9		407
Gnorimoschema operculella Zell. -----	3		94
	8		369
	9		407
Gomphocerus clavatus Thos. -----	5 (Sup.)	219, 221, 241, 255	
Goniurus proteus L. -----	9		408
Gossyparia spuria Mod. -----	2		48
	3		85
	4		138
	5	159, 203	
	6		300
	7	344-345	
	8		323
	10		508
Gracilaria negundella Chamb. -----	6		298
Gracilaria syringella F. -----	7		350
Graphocephala coccinea (Forst.) -----	9 (Sup.)		463
Graphocephala limbaticollis Stal -----	9 (Sup.)		464
Graphocephala rufimargo Walk. -----	9 (Sup.)		464
Graphocephala sanguinolenta Coqueb. -----	9 (Sup.)		464
Graphocephala versuta Say -----	6		295
	9 (Sup.)		464
Grapholitha molesta Busck -----	3	58, 71	
	4		117
	5	158, 160, 180-181	
	6		279
	7	315, 327-328	
	8		365
	9		402
	10	518-519, 536	
Grapholitha packardi Zell. -----	6		280
Graptolitha laticinerea Grote -----	6		301
Gratiaria pallidula Boh. -----	6	262, 291	
Gryllotalpa africana Bdv. -----	1		24
Gryllotalpa gryllotalpa L. -----	1		24



<i>Gryllotalpa gryllotalpa cophta</i> Haan -----	1	24
<i>Gryllotalpa hexadactyla</i> Perty -----	7	330
	9	427
<i>Gryllus assimilis</i> F. -----	3	84
	4	132
	5	173
	6	207
	7	352
<i>Gryllus domesticus</i> L. -----	1	20
	7	351- 352
	9	427
<i>Gymnaetron netum</i> Germ. -----	10	535
<i>Gymnaetron teter</i> F. -----	10	555
<i>Gymnetis liturata</i> (Oliv.) -----	9 (Sup.)	448
<i>Gymnopolybia sulfureofasciata</i> Buckl. -----	9 (Sup.)	489, 491
<i>Gynaikothrips uzeli</i> Zimm. -----	3	87
	5	207
<i>Gypona praeterita</i> Fowl. -----	9 (Sup.)	464
<i>Gypona puncticollis</i> Spangb. -----	9 (Sup.)	464
<i>Gypona signoreti</i> Stal. -----	9 (Sup.)	465
<i>Gypona vinula</i> Stal. -----	9 (Sup.)	465
<i>Gypona vulnerata</i> Walk. -----	9 (Sup.)	465
<i>Hadrotettix trifasciatus</i> Say -----	5 (Sup.)	219, 228, 231, 235, 237, 241, 245, 247, 255
<i>Haematobia irritans</i> L. -----	4	146
	5	210-211
	7	354
	9	424
<i>Haematopinus eurystermus</i> Nitz. -----	3	90
<i>Halictus pseudotegularis</i> Okll. -----	9 (Sup.)	489
<i>Halisidota ingens</i> Hy. Edw. -----	3	58, 87
<i>Halisidota schausi</i> Roths. -----	9 (Sup.)	492
<i>Halticinae</i> -----	4	96, 123-124
	5	158, 160, 184-185
	7	333
	10	509
<i>Halticus bractatus</i> (Say) -----	9 (Sup.)	483
<i>Halticus citri</i> Ashm. -----	9	419
	10	536
<i>Hamadryas antiopa</i> L. -----	3	86
	4	132
	5	203
	6	299 -300
<i>Hapalips fuscus</i> Reitt. -----	9 (Sup.)	447
<i>Harmolita tritici</i> Fitch -----	7	323
<i>Harmologa fumiferana</i> Clem.		
See <i>Cacoecia fumiferana</i> Clem.		
<i>Harrisina brillians</i> B. & McD. -----	7	340
<i>Heilipus trifasciatus</i> F. -----	9 (Sup.)	451
<i>Heliothis obsoleta</i> F. -----	1	5, 7
	2	27, 32
	3	34, 79
	4	96 ,106-107

<i>Heliothis obsoleta</i> F. (continued) -----	5	171-172
	6	273 -274, 285-286, 294
	7	313 ,314, 324, 338-339
	8	355, 358, 360-361, 368-369, 380
	9	393, 399-400, 405-406
	10	509, 513
<i>Heliothis phloxiphaga</i> G. & R. -----	6	286
<i>Heliothis virescens</i> F. -----	6	293
<i>Heliothrips fasciata</i> Perg. -----	8	371
	9	408
	10	523
<i>Heliothrips haemorrhoidalis</i> Bouche -----	9	420
<i>Heliula undalis</i> F. -----	8	374
<i>Hemerocampa costaricensis</i> Schaus -----	9 (Sup.)	492
<i>Hemerocampa leucostigma</i> S. & A. -----	6	296
<i>Hemichionaspis aspidistrae</i> Sign. -----	1	19
	9 (Sup.)	469
<i>Hemichroa americana</i> Prov. -----	9	416
<i>Hemileuca maia</i> Drury -----	4	144
	9	416
<i>Heraeus guttata</i> (Dallas) -----	9 (Sup.)	483
<i>Hesperotettix brevipennis</i> Thos. -----	5 (Sup.)	219, 228
<i>Hesperotettix speciosus</i> Scudd. -----	5 (Sup.)	219, 223, 235, 241
<i>Hesperotettix viridis</i> Thos. -----	5 (Sup.)	219, 223, 228, 231, 235, 239, 241, 245, 249, 255
<i>Heterocordylus malinus</i> Reut. -----	4	114
<i>Heteroderes laurentii</i> Guer. -----	7	320
<i>Heza similis</i> Stal -----	9 (Sup.)	483
<i>Hippiscus californicus</i> Scudd. -----	5 (Sup.)	258
<i>Hippiscus rugosus</i> Scudd. -----	5 (Sup.)	219, 223, 235 ,245
<i>Hippodamia convergens</i> Guer. -----	1	16
	4	109
	7	334
<i>Hippopsis lemniscata</i> F. -----	9	420
	9 (Sup.)	439
<i>Holocompsa azteca</i> Sauss. -----	9 (Sup.)	495
<i>Homoeotelus jansoni</i> Crotch -----	9 (Sup.)	447
<i>Homophoeta cyanipennis octomaculata</i> (Crotch) -----	9 (Sup.)	443
<i>Horiola arcuata</i> (F.) -----	9 (Sup.)	477
<i>Horiola composita</i> Walk. -----	9 (Sup.)	477
<i>Horiola picta</i> (Coqueb.) -----	9 (Sup.)	478
<i>Horistonotus uhlerii</i> Horn -----	5	166
<i>Hyadaphis xylostei</i> Schr.		
See <i>Rhopalosiphum melliferum</i> Hottes.		
<i>Hylastinus obscurus</i> Marsham -----	4	109
<i>Hylemyia antiqua</i> Meig. -----	5	193
<i>Hylemyia brassicae</i> Bouche -----	4	130-131
	5	160, 190
	8	373
<i>Hylemyia cilicrura</i> Rond. -----	2	41
	3	58 ,77
	4	101
	5	185
	8	371

<i>Hylobius pales</i> Hbst. -----	2	48
	5	200
	6	202
<i>Hylobius radialis</i> Buchanan -----	3	334
	9	417
<i>Hylurgopinus rufipes</i> Eich. -----	2	47-48
	6	209
<i>Hymenia fascialis</i> Cram. -----	3	372
<i>Hypera nigrirostris</i> F. -----	10	536
<i>Hypera postica</i> Gyll. -----	1	5, 7-8
	2	32
	3	64-65
	4	108
	5	173
	6	261, 275
	10	517
<i>Hypera punctata</i> F. -----	1	8
	4	108
<i>Hypermallus villosus</i> F. -----	6	301
	7	345-346
	8	333
<i>Hyphantria cunea</i> Drury -----	7	342-343
	8	381-382
<i>Hyphantria</i> spp. -----	5	201
<i>Hyphantria textor</i> Harr. -----	5	201
	7	343
<i>Hypochlora alba</i> Dodge -----	5	(Sup.) 219, 231, 241, 255
<i>Hypoderma</i> spp. -----	2	54
	3	89-90
<i>Hypselenotus atratus</i> Dist. -----	9	(Sup.) 484
<i>Hypselenotus loratus</i> Bredd. -----	9	(Sup.) 484
<i>Hysteroneura setariae</i> Thos. -----	3	73
<i>Icerya montserratensis</i> Riley & How. ----	9	(Sup.) 470
<i>Icerya purchasi</i> Mask. -----	1	12
	2	50
	3	50
	4	122
	5	183
	7	330
	9	474
<i>Illinoia pisi</i> Kltb. -----	1	15
	2	42
	3	31
	4	109, 128-129
	5	158, 188-189
	6	288
	7	325
<i>Illinoia solanifolii</i> Ashm. -----	4	127
	5	186-187
	6	287
	9	334
<i>Inareolata punctoria</i> Roman -----	3	(Sup.) 499-502, 344
<i>Insara intermedia</i> (Brunner) -----	9	(Sup.) 496



<i>Ips calligraphus</i> Germ. -----	5	206
<i>Iridomyrmex humilis</i> Mayr -----	1	20
	2	56
	3	308
	7	352
	8	330
<i>Iridomyrmex pruinosus</i> Roger -----	8	330
<i>Iscimaspis longirostris</i> (Sign.) -----	9 (Sup.)	470
<i>Iscimodorus sallaei</i> (Sign.) -----	9 (Sup.)	484
<i>Isoptera</i> -----	7	325
<i>Ithyacrus noveboracensis</i> Forst. -----	4	110
<i>Jadera haemateloma</i> H. S. -----	9	420
<i>Jalysus spinosus</i> Say -----	8	370
<i>Janus integer</i> Mort. -----	8	385
<i>Kaliosysphinga ulmi</i> Günd. -----	6	299
<i>Kolla fasciata</i> (Walk.) -----	9 (Sup.)	465
<i>Kolla geometrica</i> (Sign.) -----	9 (Sup.)	466
<i>Laboridea allii</i> Knight -----	5	133
<i>Lachmus caryae</i> Harr. -----	3	74
<i>Lachmus thajafilina</i> Del Guér. -----	2	51
<i>Lampethusa anatina</i> Dist. -----	9 (Sup.)	484
<i>Laphygma exigua</i> Hbn. -----	3	79
	4	134
<i>Laphygma frugiperda</i> G. & A. -----	6	261,276
	7	313,319
	8	355,357-358
	9	397
<i>Lariophagus distinguendus</i> Forst. -----	10	518
<i>Lasioderma serricorne</i> L. -----	7	354
	9	426
<i>Lasiophthicus pyrastris</i> L. -----	4	109
<i>Lasioptera clavula</i> Benth. -----	3	88
<i>Lasiosteryx vitis</i> O. S. -----	6	281
<i>Lasius interjectus</i> Mayr -----	2	56
	3	92
<i>Lasius</i> sp. -----	1	20
<i>Laspeyresia caryana</i> Fitch -----	3	74
	8	366
	9	403
<i>Laspeyresia nigricana</i> Steph. -----	7	315
<i>Laspeyresia prunivora</i> Walsh -----	9	395
<i>Latredectus noctans</i> F. -----	6	306
	8	388
	9	423-424
<i>Lebia soror</i> Chaud. -----	9 (Sup.)	438
<i>Lecaniodiaspis pruinosa</i> Hunter -----	4	137
<i>Lecanium corni</i> Bouche -----	3	85
	4	111
<i>Lecanium nigrofasciatum</i> Perg. -----	3	86
<i>Lecanium pruinatum</i> Coq. -----	1	10
<i>Lecanium quercifex</i> Fitch -----	3	86
<i>Leis conformis</i> Bdv. -----	2	39

Lema trilineata Oliv. -----	6	305
	7	349
Lepidosaphes beckii Newm. -----	7	329
	9	404
	9 (Sup.)	470
Lepidosaphes camelliae Hoke -----	2	51
Lepidosaphes halli Green -----	1	11
Lepidosaphes ulmi L. -----	2	47,51
	3	88
	4	141
	6	382
Lepisma saccharina L. -----	3	391
	9	427
Leptinotarsa decemlineata Say -----	2	42
	3	78
	4	126
	5	186
	6	262,284
	7	315,330-331
	9	389
	9	407
Leptocoris trivittatus Say -----	1	2
Leptocoris tituloides (Deg.) -----	9 (Sup.)	484
Leptoglossus cyllorae L. -----	3	375
	9	404
Leptoglossus stigma (Hbst.) -----	9 (Sup.)	484
Leptoglossus zonatus (Dallas) -----	9 (Sup.)	484
Liburnia teapae Fowl. -----	9 (Sup.)	473
Lichocrota cavillator Walk. -----	9 (Sup.)	492
Ligyrocoris litigiosus (Stal) -----	9 (Sup.)	484
Ligyrocoris multispinus Stal -----	9 (Sup.)	485
Ligyris gibbosus Deg. -----	4	131
	5	131
	6	275
	7	335
	9	407
Limonius canus Loe. -----	1	60-61
	4	102
Limonius californicus Mann. -----	1	60
	1	102
	3	268
Limonius ectypus Say -----	3	408
Limonius infuscatus Mots. -----	1	60
Limonius sp. -----	7	320
Liothrips setosi Hood -----	9 (Sup.)	497
Liponyssus bacoti Hirst -----	1	21
	2	89
	4	146
Listroderes obliquus Klug -----	1	5,12
	2	28, 40-41
	3	76-77
	4	123
Listronotus latiusculus Boh. -----	3	158,192
Lithocolletis hamadryalla Clem. -----	7	346
Lixus concavus Say -----	4	133
	5	195
	6	292

Lobometopon guatemalensis (Champ.) -----	9 (Sup.)	449
Longistigma caryae Harr. -----	2	49
Longitarsus waterhousei Kutsch. -----	5	195
	6	202
Lopidea davisi Knight -----	8	327
Lopidea robiniae Uhl. -----	5	182
Loxostege similalis Guen. -----	6	268,294
Loxostege spp. -----	6	261,267
Loxostege sticticalis L. -----	5	160,195
	6	267
	7	315,319-320
Ludius noxius Hyslop -----	3	60
Ludius spp. -----	7	320
	9	394
Lycophotia margaritosa saucia Hbn. -----	3	59-60
	4	100
	5	165
	6	267
Lycorea atergatis (Doubl. & Hewits.) ---	9 (Sup.)	492
Lyctus spp. -----	8	390
	9	426
	10	536
Lyctus planicollis Lec. -----	1	23
Lydella stabulans grisea R. Deev. --	9 (Sup.)	499-502
Lygaeonematus erichsonii Htg. -----	5	204
	7	316
Lygaeus bistrigularis Say -----	9 (Sup.)	485
Lygaeus reclusianus Say -----	9 (Sup.)	485
Lygaeus sallaei Stal -----	9 (Sup.)	485
Lygaeus uhleri Stal -----	9 (Sup.)	485
Lygide mendax Reut. -----	4	114
Lygus caryae Knight -----	5	174
Lygus elisus Van D. -----	6	275
	7	313,331
Lygus elisus hesperus Knight -----	6	275
Lygus pratensis L. -----	3	65,66,78
	4	126
	5	160,174
	6	279
	10	522
Lytta nuttalli Say -----	6	282,283
	7	314
Macaria granitata Guen. -----	7	347
Macrobasis albida Say -----	7	330
Macrobasis tarsa Lec. -----	5	207
Macrobasis unicolor Kby. -----	6	283
Macrocentrus gifuensis Ashm. -----	9 (Sup.)	503
Macroductylus lineatus Chevr. -----	9 (Sup.)	448
Macroductylus suavis Bates -----	9 (Sup.)	448
Macroductylus subspinosus F. -----	4	104
	5	157,167-168
	6	261,268
Macroductylus sylphis Bates -----	9 (Sup.)	443



Macrosiphum aucubae Bartholomew -----	1	19
Macrosiphum liriodendri Monell -----	7	347
Macrosiphum rosae L. -----	9 (Sup.)	454
Macropsis trimaculata Fitch -----	4	118
Magiccicada septendecim L. -----	3	57
	4	95
	10	525-527
Malacorhinus decempunctatus Jacoby -----	9 (Sup.)	443
Malacosoma americana F. -----	2	36
	3	58, 68-69
	4	96, 112-113
	5	158, 160, 177
	10	519, 528
Malacosoma constricta Stretch -----	6	296
Malacosoma disstria Hbn. -----	2	46
	3	58, 85
	4	97, 136
	5	160, 200-201
	6	296
	7	342
Malacosoma sp. -----	2	46-47
	5	160
Mamestra picta Harr. -----	5	189
Mansonina perturbans Walk. -----	10	533
Margarodes spp. -----	5	207
Maruca testulalis Geyer -----	3	94
Mecistorhinus tripterus (F.) -----	9 (Sup.)	485
Megalopta idalia Smith -----	9 (Sup.)	489
Megalopyge oenocularis S. & A. -----	8	388
	9	423
Melanocallis caryaefoliae Davis -----	3	74
	4	121
	8	366-367
	9	403
Melanophila fulvoguttata Harr. -----	9	417
Melanoplus angustipennis Dodge -----	5 (Sup.)	219-257
Melanoplus bivittatus Say -----	5	161, 163
	5 (Sup.)	217-259
	6	263-266
	7	318
	9	396
	10	511, 512, 513
Melanoplus bowditchi Scudd. -----	5 (Sup.)	219, 228, 231, 233, 241, 255
Melanoplus confusus Scudd. -----	5 (Sup.)	228, 231, 245, 255
Melanoplus dawsoni Scudd. -----	5 (Sup.)	220-255
Melanoplus devastator Scudd. -----	5	163
	6	266
Melanoplus differentialis Thos. -----	4	98
	5	163
	5 (Sup.)	217-259
	6	263, 266
	8	356
	9	396, 397
	10	511, 512, 513

Melanoplus Dodgei Thos. -----	5 (Sup.)	220,221
Melanoplus femur-rubrum Deg. -----	4	98
	5	162,163
	5 (Sup.)	220-259
	6	263,265,266
	7	318
	8	356
	9	396
	10	513
Melanoplus flavidus Scudd. -----	5 (Sup.)	220
Melanoplus fluvialtilis Brun. -----	5 (Sup.)	220,221
Melanoplus Gladstoni Scudd. -----	5 (Sup.)	220,245,255,258
Melanoplus infantilis Scudd. -----	5 (Sup.)	220,221,223,228,231, 233,235,239,241,245, 255,259
Melanoplus Keeleri Thos. -----	5 (Sup.)	220
Melanoplus Keeleri luridus Dodge -----	5 (Sup.)	228,255
Melanoplus lacinus Scudd. -----	5 (Sup.)	220,221,235,246,247, 258
Melanoplus marginatus Scudd. -----	5 (Sup.)	252
Melanoplus mexicanus Sauss. -----	4	98
	5	161,163
	5 (Sup.)	218-259
	6	263-266
	7	318
	8	356
	9	396
	10	511,512,513
Melanoplus mexicanus soretus Walsh -----	6	265
Melanoplus occidentalis Thos. -----	5 (Sup.)	220,231,235,246,255
Melanoplus packardii Scudd. -----	5 (Sup.)	220-258
	7	318
	9	396
Melanoplus pictus Scudd. -----	5 (Sup.)	258
Melanoplus spp. -----	7	317,318
Melanotus sp. -----	5	166
Melanotus spp. -----	6	268
Melittia satyriniformis Hbn. -----	5	192
	7	334
Meloe impressus Kby. -----	4	131
Meloidae -----	5	185
	6	262
	7	314
Melophagus ovinus L. -----	4	146
Membracis mexicana Guer. -----	9 (Sup.)	478
Mermiria maculipennis Rehn -----	5 (Sup.)	220,235,243,246,249, 250,255
Mermiria maculipennis mcclungi Rehn -----	5 (Sup.)	239,242
Mermiria neomexicana Thos. -----	5 (Sup.)	223
Meromyza americana Fitch -----	5	169
	7	315
Mesocondyla concordalis Hbn. -----	9 (Sup.)	432
Mestobregma Kiowa Thos. -----	5 (Sup.)	220-259
	6	264,265

Metamasius sericeus (Oliv.) -----	9 (Sup.)	451
Metator pardalinus Sauss. -----	5 (Sup.)	220, 232, 235, 236, 237, 242, 243, 246, 247, 255, 257
	6	264
Meteorus acronyctae Mues. -----	6	302
Meteorus nigricolis Thoms. -----	9 (Sup.)	503
Metriona angularis (Champ.) -----	9 (Sup.)	443
Metriona bicolor F. -----	5	196
	7	335
Metriona bivittata Say -----	5	196
Metriona emarginata (Boh.) -----	9 (Sup.)	444
Metriona judaica (F.) -----	9 (Sup.)	444
Metriona procinqua (Dej.) -----	9 (Sup.)	444
Metriona ruella (Boh.) -----	9 (Sup.)	444
Metriona zona (F.) -----	9 (Sup.)	444
Metrosura ruficeps Scudd. -----	9 (Sup.)	497
Microbracon brevicornis Wesm. -----	9 (Sup.)	503
Microbracon terebella (Wesm.) -----	10	536
Microgaster tibialis Nees -----	9 (Sup.)	499-501, 503, 505
Micrutalis ephippium (Burm.) -----	9 (Sup.)	478
Micrutalis lugubrina (Stal) -----	9 (Sup.)	478
Mineola indigenella Zell. -----	5	177
	7	328
Mineola vaccinii Riley -----	7	329
Miridae -----	4	114
Miris dolabratus L. -----	4	110
Mollusca -----	3	83
Monanthia monotropidia Stal -----	9 (Sup.)	485
Monarthronalpus buxi Laboulb. -----	2	51
	9	420
Monellia costalis Fitch -----	3	74
	4	121
Monellia nigropunctata Granovsky -----	3	74
	4	121
Monachamus marmorator Fov. -----	7	345
Monocrepidius aversus Fov. -----	9 (Sup.)	447
Monocrepidius vespertinus F. -----	5	166
	6	268
Monomorium minimum Buckl. -----	6	302
	7	352
	8	390
Monomorium pharaonis L. -----	8	390
Monophadnoides rubi Harr. -----	5	183
	6	261, 280
Monoptilota pergratialis Hulst -----	8	371
Mordwilkoja vagabunda Walsh -----	2	42
	6	303
Mormidea notulata (H.S.) -----	9 (Sup.)	405
Murgantia histrionica Hahn -----	1	16
	2	43
	3	81
	4	130
	8	373



Murgantia histrionica Hahn (Cont'd)	9	410
	10	509
Mycetophilidae -----	3	64
Myelois venipars Dyar -----	4	123
	5	183
Myochrous denticollis Say -----	5	173
Myodocha unispinosa Stal -----	9 (Sup.)	485
Myzocallis kahawaluokalani Kirk. -----	4	142
Myzocallis walshii Monell -----	4	139
Myzus cerasi F. -----	3	72
	5	132
	6	280
Myzus persicae Sulz. -----	1	10
	2	43
	3	82
	4	118
	5	195
	9	411
Napomyza chrysanthemi Kowarz -----	4	143
Nasutermes costalis Holmg. -----	9 (Sup.)	497
Nemorilla floralis Fall. -----	9 (Sup.)	503
Naupactus leucoloma Boh. -----	8	359
	10	535
Neoclytus caprea Say -----	2	47
	4	137
Neodiprion abbotii Leach -----	9	417
Neodiprion pinetum Nort. -----	6	302
Neodiprion polytomum Htg.		
See Diprion polytomum Htg.		
Neodiprion sp. -----	6	302
Neolecanium cornuparvum Thro -----	4	143
	7	350
	9	421
Neotetranychus buxi Garman -----	8	336
Neoxabea bipunctata (Deg.) -----	9 (Sup.)	495
Nephelodes emmedonia Cram. -----	4	99
Neurocolpus mexicanus Dist. -----	9 (Sup.)	486
Nezara viridula L. -----	1	13
	2	41
	8	368
	9	406
	9 (Sup.)	486
Noctuidae -----	1	13
	2	27,29
	3	59-60
	4	95,99-101
	5	157,159,164-165
	8	357
	10	524-525
Nodonota irazuensis (Jacoby) -----	9 (Sup.)	444-445
Nodonota lateralis (Jacoby) -----	9 (Sup.)	445
Nodonota puncticollis Say -----	4	143
	5	157,174
Notoxus eximius Champ. -----	9 (Sup.)	438

<i>Nygmia phaeorrhoea</i> Donovan. -----	4	137
	7	342
	10	532
<i>Nysius californicus</i> Stal. -----	9 (Sup.)	486
<i>Nysius ementitus</i> Dist. -----	9 (Sup.)	486
<i>Nysius ericae</i> Schill. -----	1	13
	2	41
	4	110,125-126
	5	158
	5	184
	6	262,283-284
	7	330
	8	373
	9	406-407
<i>Oberea bimaculata</i> Oliv. -----	1	10
	4	119
	5	209
<i>Oberea schaumii</i> Lec. -----	8	384
<i>Ochrosidia immaculata</i> Oliv. -----	5	167
	6	269
<i>Ochresthes pollinosus</i> (Chevr.) -----	9 (Sup.)	439
<i>Ochrosidia villosa</i> Burm. -----	9	419
<i>Oecanthus nigricornis</i> quadripunctatus Beut. 3		58,73
<i>Oecanthus niveus</i> Deg. -----	2	38
<i>Oecleus addendus</i> Fowl. -----	9 (Sup.)	474
<i>Oedaleonotus borckii</i> pacificus Scudd. ---	5 (Sup.)	258
<i>Oedaleonotus enigma</i> Scudd. -----	5	163
	5 (Sup.)	258
	6	266
<i>Oedionychis reichei</i> Harold -----	9 (Sup.)	445
<i>Oedionychis tenuicincta</i> Jacoby -----	9 (Sup.)	446
<i>Oligia fractilinea</i> Grote -----	5	164
<i>Oncideres cingulatus</i> Say -----	8	366
	9	403
<i>Oncometopia undata</i> (F.) -----	9 (Sup.)	466
<i>Oveia obscura</i> Thos. -----	5 (Sup.)	220-255
<i>Opsiphanes corrosus</i> Stict. -----	9 (Sup.)	492
<i>Orchestes pallicornis</i> Say -----	3	70
	4	115
<i>Orchestes rufipes</i> Lec. -----	8	385
<i>Ornithodoros megnini</i> Duges -----	2	54
<i>Ornithodoros turnicata</i> Duges -----	5	210
<i>Orphulella pelidna</i> Burm. -----	5 (Sup.)	228,246
<i>Orphulella speciosa</i> Scudd. -----	5 (Sup.)	228,232,239,242,246
<i>Orthaea bilbota</i> (Say) -----	9 (Sup.)	486
<i>Orthezia insignis</i> Dougl. -----	9 (Sup.)	470
<i>Ortholmus jamaicensis</i> Dallas -----	9 (Sup.)	486
<i>Oryzaephilus surinamensis</i> L. -----	8	391
<i>Osbornellus mexicanus</i> Osb. -----	9 (Sup.)	466
<i>Oxyptilus periscelidactylus</i> Fitch -----	4	120
	5	158,183
<i>Pachybrachys femoratus</i> (Oliv.) -----	9 (Sup.)	446
<i>Pachycoris torridus</i> (Scop.) -----	9 (Sup.)	486
<i>Pachynematus ocreatus</i> Harr. -----	7	316

<i>Pachypsylla gemma</i> Riley -----	4	138
<i>Pachystethus marginata</i> F. -----	5	179
<i>Pachystethus micans</i> (Burm.) -----	9 (Sup.)	448
<i>Pachystethus nitidula</i> (Blanch.) -----	9 (Sup.)	448
<i>Pachyzancla bipunctalis</i> F. -----	9	406
<i>Padaeus viduus</i> (Voll.) -----	9 (Sup.)	486
<i>Paleacrita vernata</i> Peck -----	2	28,46
	4	135
	5	199
	6	297
<i>Panchlora cubensis</i> Sauss. -----	9 (Sup.)	495
<i>Pangaeus piceatus</i> Stal -----	9 (Sup.)	487
<i>Pantomorus femoratus</i> Sharp -----	9 (Sup.)	451
<i>Papaipema nebris nitela</i> Guen. -----	5	157,171
	6	274
<i>Papilio polydamas</i> L. -----	9 (Sup.)	492
<i>Papilio polyxenes stabilis</i> R. & J. -----	9 (Sup.)	493
<i>Papilio thoas autocles</i> Rothsch. -----	9 (Sup.)	493
<i>Paracalocoris annulatus</i> Dist. -----	9 (Sup.)	487
<i>Paracalocoris jurgiosus</i> (Stal) -----	9 (Sup.)	487
<i>Paracalocoris molliculus</i> Dist. -----	9 (Sup.)	487
<i>Parachartergus apicalis</i> (F.) -----	9 (Sup.)	491
<i>Paraclemensia acerifoliella</i> Fitch -----	9	417
<i>Paralechia pinifoliella</i> Chamb. -----	2	48
	4	140
	5	206
<i>Paralucilia fulvipes</i> Macq. -----	7	314,353-354
<i>Paranthene polistiformis</i> Harr. -----	3	73
<i>Paratetranychus citri</i> McG. -----	2	40
	3	76
	6	282
<i>Paratetranychus pilosus</i> C. & F. -----	2	27,37
	3	70
	4	115
	5	179
	6	278
	7	527
	8	364
<i>Paratetranychus uniunguis</i> Jacobi -----	4	141
<i>Paratettix mexicanus abortus</i> Hancock -----	9 (Sup.)	496
<i>Paratrioxa cockerelli</i> Sulc. -----	4	127
	6	286-287
	9	395,408
<i>Pardalophora haldemanii</i> Scudd. -----	5	162,163
<i>Parharmonia pini</i> Kellicott -----	4	140
	6	302
<i>Parlatoria oleae</i> Colv. -----	2	50
<i>Parlatoria pergandii</i> Comst. -----	2	50
<i>Pectinophora gossypiella</i> Saund. -----	2	28,45
	3	83
	6	294-295
	7	314,338
	8	380-381
	9	412-413
	10	521



<i>Pegomyia hyoscyami</i> Panz -----	5	194-195
<i>Pemphigus vagabundus</i> Walsh. ....		
See <i>Mordwilkoja vagabunda</i> Walsh.		
<i>Peranabrus scabricollis</i> Thos.-----	6	267
<i>Peregrinus maidis</i> Ashm.-----	7	324
	9 (Sup.)	474
<i>Periclista</i> sp. -----	4	121
<i>Phaeogenes nigridens</i> Wesm. -----	9 (Sup.)	503
<i>Phenacoccus cevalliae</i> Ckll. -----	10	523
<i>Phenacoccus gossypii</i> T. & C. -----	6	282
<i>Phera obtusifrons</i> Fowl. -----	9 (Sup.)	466
<i>Philaemus leucophthalmus</i> L. -----	4	109
<i>Philonthus feralis</i> Erichs. -----	9 (Sup.)	449
<i>Phlegethontius quinquemaculata</i> Haw.		
See <i>Protoparce quinquemaculata</i> Haw.		
<i>Phlegethontius sexta</i> Johan.		
See <i>Protoparce sexta</i> Johan.		
<i>Phlibostroma quadrimaculatum</i> Thos.-----	5 (Sup.)	220-259
<i>Phloeosinus cristatus</i> Lec. -----	8	386
<i>Phloeosinus dentatus</i> Say -----	4	142
<i>Phlyctaenia rubigalis</i> Guen. -----	2	44
<i>Phobetron hipparchia</i> Cram. -----	9 (Sup.)	493
<i>Phoetaliotes nebrascensis</i> Thos. -----	5 (Sup.)	220-256
<i>Phormia</i> sp. -----	4	145
<i>Phorocera erecta</i> Coq. -----	9 (Sup.)	503
<i>Phorodon humuli</i> Schr. -----	1	17
	4	119
<i>Phryganidia californica</i> Pack. -----	5	205
<i>Phyllaphis fagi</i> L. -----	4	137
	9	416
<i>Phyllocoptes oleivorus</i> Ashm. -----	1	12
	2	40
	3	76
	4	122
	6	282
	8	367
	9	404
<i>Phyllophaga bipartita</i> Horn -----	4	102
<i>Phyllophaga calceata</i> Lec. -----	2	29
<i>Phyllophaga congrua</i> Lec. -----	2	29
<i>Phyllophaga crassissima</i> Blanch. -----	2	29
<i>Phyllophaga ephilida</i> Say -----	6	268
<i>Phyllophaga fusca</i> Froel. -----	4	102
<i>Phyllophaga futilis</i> Lec. -----	4	102
<i>Phyllophaga hirticula</i> Knoch -----	4	102
<i>Phyllophaga hirtiventris</i> Horn -----	2	29
<i>Phyllophaga horni</i> Smith -----	4	102
<i>Phyllophaga inversa</i> Horn -----	4	102
<i>Phyllophaga lanceolata</i> Say -----	9	398
<i>Phyllophaga micans</i> Knoch -----	3	61
	5	166
<i>Phyllophaga praetermissa</i> Horn -----	2	29
<i>Phyllophaga profunda</i> Blanch. -----	2	29
<i>Phyllophaga rubiginosa</i> Lec. -----	2	29

Phyllophaga spp. -----	1	5
	2	29
	3	61
	4	95, 102-103
	5	159-160, 166-167, 206
	6	268
	7	320
	8	358-359
	9	398
Phyllophaga tristis F. -----	3	61
	4	102
	5	166, 167
Phyllotreta pusilla Horn -----	6	284
Phyllotreta vittata F. -----	4	123
	5	185
	7	333
	8	373
Phylloxera caryaecaulis Fitch -----	5	204
Phylloxera caryaeseptem Shim. -----	8	367
Phylloxera devastatrix Perg. -----	4	121
Phylloxera notabilis Perg. -----	4	121
Phyrdenus divergens (Germ.) -----	9 (Sup.)	451
Phytodecta pallida L. -----	5	207
Phytophaga destructor Say -----	1	5, 6
	2	27, 31
	3	57, 63
	4	95, 106
	5	157, 169
	6	261, 271
	6 (Sup.)	309-311
	7	313, 322-323
	8	359-360
	9	398
	10	509, 514-515
Phytophaga rigida O. S. -----	3	87
Phytophaga ulmi Beautm. -----	8	382
Pieris elodia Boisd. -----	9 (Sup.)	493
Pieris monuste L. -----	3	60
Piesma cinerea (Say) -----	9 (Sup.)	487
Pineus strobil Htg. -----	2	48
	4	140
Pissodes approximatus Hopk. -----	6	302
	7	346
	8	384
Pissodes deodarae Hopk. <u>See</u> P. nemorensis Germ.		
Pissodes nemorensis Germ. -----	1	18
	2	52
	8	386
Pissodes strobil Peck -----	3	87
	7	346
Plagioderia versicolora Laich. -----	4	141
	7	347
Platycarenum humilis (H. S.) -----	9 (Sup.)	487
Platymetopius frontalis Van D. -----	9 (Sup.)	466-467

<i>Platyptilia carduidactyla</i> Riley -----	6	292
<i>Platysamia cecropia</i> L. -----	7	316,349
<i>Platytylellus latipennis</i> (Stal) -----	9 (Sup.)	487
<i>Plecia aterrima</i> Bell -----	9 (Sup.)	453
<i>Plodia interpunctella</i> Hbn. -----	3	92
	9	427
<i>Plutella maculipennis</i> Curt. -----	1	15
	2	53
	4	129
	5	189
	7	333
	8	372
	9	410
	9 (Sup.)	493
<i>Podosesia syringae</i> Harr. -----	4	142
	8	387
<i>Poecilocapsus lineatus</i> F. -----	6	304
<i>Pogonomyrmex barbatus</i> F. Smith -----	6	308
<i>Pogonomyrmex occidentalis</i> Cress. -----	4	148
	5	212
<i>Polistes major</i> Beauv. -----	9 (Sup.)	490
<i>Pollenia rudis</i> F. -----	3	89
<i>Polychrosis botrana</i> Schiff. -----	1	24
<i>Polychrosis viteana</i> Clem. -----	8	365
<i>Polygonia interrogationis</i> F. -----	6	299
<i>Polymerus cuneatus</i> (Dist.) -----	9 (Sup.)	487
<i>Pomphopoea sayi</i> Lec. -----	4	119
	5	207
<i>Pontia monuste</i> L. -----	5	165
<i>Popillia japonica</i> Newm. -----	2	29
	3	58, 61-62
	4	103
	5	167
	6	261, 262-270
	7	313, 320-321
	10	510, 528-529
<i>Porosagrotis orthogonia</i> Morr. -----	4	100, 101
	5	164
	7	314, 319
	9	394
<i>Porthetria dispar</i> L. -----	2	47
	6	296-297
	7	342
	10	510, 531
<i>Potnia brevicornis</i> Fowl. -----	9 (Sup.)	478
<i>Prionomerus calceatus</i> Say -----	4	142
<i>Prionoxystus robiniae</i> Peck -----	4	137
	8	383
<i>Prionoxystus</i> sp. -----	6	298
<i>Prionus californicus</i> Mots. -----	4	123
<i>Prionus heroicus</i> Semen -----	4	123
<i>Prionus laticollis</i> Drury -----	4	139
<i>Pristiphora banksi</i> Marl. -----	7	345
<i>Pristiphora geniculata</i> Htg. -----	6	262, 301
	7	345



<i>Prodenia eridania</i> Cram. -----	1	16
<i>Prodenia ornithogalli</i> Guen. -----	5	165
<i>Protalebra decorata</i> Osborn -----	9 (Sup.)	467
<i>Protoparce quinquemaculata</i> Haw. -----	5	187
	6	293
	8	370, 376
	9	412
<i>Protoparce sexta</i> Johan. -----	5	187
	6	286, 293
	8	370, 376
	9	412
<i>Protoparce</i> spp. -----	7	331, 336
	8	375-376
	9	407
<i>Proxys punctulatus</i> (Beauv.) -----	9 (Sup.)	487
<i>Proxys victor</i> (F.) -----	9 (Sup.)	488
<i>Psallus seriatus</i> Reut. -----	2	28, 45-46
	4	134-135
	5	197-198
	6	295
	7	341
	9	415
	10	522, 536
<i>Pseudaonidea paeoniae</i> Ckll. -----	9	420
<i>Pseudischnaspis bowreyi</i> (Ckll.) -----	9 (Sup.)	470
<i>Pseudococcus citri</i> Risso -----	1	11
	6	282
	9	420
	9 (Sup.)	470
<i>Pseudococcus comstocki</i> Kuw. -----	10	536
<i>Pseudococcus gahani</i> Green -----	1	11
<i>Pseudococcus maritimus</i> Ehrh. -----	1	11
<i>Pseudococcus nipae</i> (Mask.) -----	9 (Sup.)	470
<i>Pseudococcus</i> sp. -----	7	325
<i>Pseudococcus virgatus</i> (Ckll.) -----	9 (Sup.)	470
<i>Pseudogaurax signata</i> Loew -----	10	536
<i>Pseudophilippa quaintancii</i> Ckll. -----	6	303
<i>Pseudothrips</i> sp. -----	10	523
<i>Psila rosae</i> F. -----	5	194
<i>Psilocorsia faginella</i> Chamb. -----	9	416
<i>Psorosina hammondi</i> Riley -----	7	327
<i>Psyche nigrita</i> B. & McD. -----	9	393, 418
<i>Psyllia pyricola</i> Foerst. -----	3	72
	4	118-119
	5	182
	6	279
<i>Pterichthya pisciformis</i> Thomson -----	9 (Sup.)	439
<i>Pteronidea ribesii</i> Scop. -----	3	73
	4	120
<i>Pteronidea ventralis</i> Say -----	4	141
<i>Pterygia bituberculata</i> Fowl. -----	9 (Sup.)	478
<i>Ptinus brunneus</i> Duft. -----	4	148
<i>Ptinus tectus</i> Boieldieu -----	2	56
<i>Ptychodes lecontei</i> Thomson -----	9 (Sup.)	439

<i>Pulex irritans</i> L. -----	3	89
	7	351
<i>Pulvinaria psidii</i> Mask. -----	9 (Sup.)	470
<i>Pulvinaria vitis</i> L. -----	5	204-205
	6	301
<i>Pycnoderes atratus</i> (Dist.) -----	9 (Sup.)	488
<i>Pycnoderes incurvus</i> (Dist.) -----	9 (Sup.)	488
<i>Pyrausta nubilalis</i> Hbn. -----	1	24
	2	32
	4	107
	4 (Sup.)	149-156
	7	315
	8	355, 361
	9	395, 407
	9 (Sup.)	429-436, 499-505
	10	513
<i>Pyrota engelmanni</i> Lec. -----	5	202
<i>Recurvaria apictripunctella</i> Clem. -----	3	86
<i>Repipta flavicans</i> (Amy. & Serv.) -----	9 (Sup.)	488
<i>Repipta taurus</i> (F.) -----	9 (Sup.)	488
<i>Reticulitermes flavipes</i> Kol. -----	1	22
	2	55
	3	91
	4	147
	7	354
<i>Reticulitermes</i> spp. -----	1	22
	2	55
	3	91
	4	97, 147-148
	5	212
<i>Reticulitermes tibialis</i> Banks -----	1	22
	3	91
	4	148
	5	212
	7	354
<i>Rhagoletis cingulata</i> Loew -----	5	182
	6	279
<i>Rhagoletis fausta</i> O. S. -----	5	182
<i>Rhagoletis pomonella</i> Walsh -----	5	178
	6	277-278
	9	402
<i>Rhinospathe albomarginata</i> Chevr. -----	9 (Sup.)	451
<i>Rhipicephalus sanguinius</i> Latr. -----	7	353
<i>Rhipipteryx biolleyi</i> Sauss. -----	9 (Sup.)	496
<i>Rhizoecus coffeae</i> Laing -----	9 (Sup.)	470
<i>Rhizoecus terrestris</i> Newst. -----	1	18
<i>Rhizoglyphus hyacinthi</i> Bdv. -----	7	350
	9	421
<i>Rhodobaenus tredecimpunctatus</i> Ill. -----	8	386
<i>Rhopalictus lachnes</i> Bachal -----	9 (Sup.)	490
<i>Rhopalosiphum melliferum</i> Hottes -----	5	208
<i>Rhopalosiphum prunifoliae</i> Fitch -----	3	66 -67
	4	113

<i>Rhopalosiphum pseudobrassicae</i> Davis -----	1	16
	2	44
	8	374
	9	411
	9 (Sup.)	454
<i>Rhopalosiphum</i> sp. -----	4	134
<i>Rhopobota naevana ilicifoliana</i> Kearf. -----	6	304
<i>Rhyacionia bouliana</i> Schiff. -----	4	140
	5	205
	6	302
<i>Rhyacionia frustrana</i> Comst. -----	5	206
	7	346
<i>Rhodobaenus stigmaticus</i> (Fahraeus) -----	9 (Sup.)	452
<i>Rhodobaenus tridecempunctatus graphicus</i> Champ. -----	9 (Sup.)	452
<i>Rhynchites bicolor</i> F. -----	5	209
	6	305
<i>Rhynchosciara brevicornis</i> Guer. -----	9 (Sup.)	453
<i>Richardia podagrica</i> (F.) -----	9 (Sup.)	453
<i>Richardia telescopica</i> Gerst. -----	9 (Sup.)	453
<i>Rodolia cardinalis</i> Muls. -----	2	50
<i>Romalea microptera</i> Beauv. -----	5	163
	7	318
<i>Saccharosydne saccharivora</i> (Westwood) -----	10	535
<i>Saissetia hemisphaerica</i> Targ. -----	4	143
	9 (Sup.)	471
<i>Saissetia oleae</i> Bern. -----	1	18
	9 (Sup.)	471
<i>Saperda candida</i> Fab. -----	7	315
<i>Saperda vestita</i> Say -----	4	139
	7	345
<i>Sarcophaga kellyi</i> Ald. -----	5	163
	6	265
<i>Scepteriscus acletus</i> R. & H. -----	5	206
<i>Scepteriscus vicinus</i> Scudd. -----	2	41
<i>Sciara inconstans</i> Fitch -----	9	419
<i>Scirtothrips citri</i> Moul. -----	2	39
	4	122
<i>Schistocerca alutacea</i> Harr. -----	5 (Sup.)	225
<i>Schistocerca americana</i> Drury -----	4	98
	5	162
	5 (Sup.)	223
<i>Schistocerca impleta</i> Walk. -----	9 (Sup.)	496
<i>Schistocerca lineata</i> Scudd. -----	5 (Sup.)	220, 223, 232, 246
<i>Schistocerca shoshone</i> Thos. -----	5 (Sup.)	249
<i>Schistocerca vaga</i> Scudd. -----	5 (Sup.)	258
<i>Schistocerca venusta</i> Scudd. -----	5 (Sup.)	258
<i>Schizura concinna</i> S. & A. -----	7	349
	8	364
	9	401
<i>Schoenicus panamensis</i> Champ. -----	9 (Sup.)	449
<i>Scolia dubia</i> Say -----	7	348
	8	385
<i>Scolytus multistriatus</i> Marsham -----	7	344
	9	393, 416
	10	530-531



<i>Scolytus rugulosus</i> Ratz. -----	5	175
	9	402
<i>Scutigerella immaculata</i> Newp. -----	1	14
<i>Solenothrips rubrocinetus</i> (Giard) -----	9 (Sup.)	417
<i>Sericothrips variabilis</i> Beach -----	4	151
	10	523
<i>Sesamia</i> sp. -----	1	74
<i>Sibine apicalis</i> Dyar -----	9 (Sup.)	423
<i>Sibine opheliana</i> Dyar -----	9 (Sup.)	415
<i>Sibine stimulca</i> Clem. -----	5	322
<i>Simulium</i> sp. -----	4	146
	5	211
<i>Sipha flava</i> Forbes -----	3	94
<i>Sitona prominens</i> Csy. -----	5	129
<i>Sitophilus granaria</i> L. -----	9	425
<i>Sitophilus oryzae</i> L. -----	9	428
<i>Sitotroga cerealella</i> Oliv. -----	4	142
<i>Sogata furcifera</i> Horv. -----	9 (Sup.)	174
<i>Solenopsis geminata</i> (F.) -----	9 (Sup.)	175
<i>Solenopsis xyloni</i> McCook -----	1	10
	2	56
	3	92
	6	308
	7	350
	8	420
<i>Spanbergiella mexicana</i> Bak. -----	9 (Sup.)	427
<i>Spaniotoma</i> sp. -----	1	14
<i>Spharagemon bolli</i> Scudd. -----	5 (Sup.)	220, 242, 246
<i>Spharagemon collare</i> Scudd. -----	5 (Sup.)	220-246
<i>Spharagemon equale</i> Say -----	5 (Sup.)	220-256
<i>Sphictyrtus longirostris</i> Dist. -----	9 (Sup.)	426
<i>Spilochalcis femorata</i> (F.) -----	9 (Sup.)	490
<i>Spilonota ocellana</i> Schiff. -----	5	177
<i>Spongophorus ballista</i> (Germ.) -----	9 (Sup.)	178
<i>Stalpus marginalis</i> Burm. -----	9 (Sup.)	426
<i>Steirarrhinus nebulosus</i> Champ. -----	9 (Sup.)	452
<i>Stenoma sororia</i> (Zell.) -----	9 (Sup.)	413
<i>Stenomacra marginella</i> (H. S.) -----	(Sup.)	438
<i>Stephanitis pyrioides</i> Scott -----	8	326
<i>Stephanitis rhododendri</i> Horv. -----	2	53
	5	241
<i>Sterictophora cellularis</i> Say -----	5	192
<i>Stethophyma gracile</i> Thos. -----	5 (Sup.)	328
<i>Stictocephala festina</i> (Say) -----	9 (Sup.)	429
<i>Stilpnochlora azteca</i> (Sauss.) -----	9 (Sup.)	197
<i>Stilpnotia salicis</i> L. -----	5	391
	6	242, 247
	7	312, 312
	10	332
<i>Stirellus bicolor</i> (Van D.) -----	9 (Sup.)	427
<i>Stomacoccus platani</i> Ferris -----	5	305
<i>Stomoxys calcitrans</i> L. -----	4	143
	5	111
	6	307
	9	424

<i>Scriabinella rutelina</i> Bates -----	9 (Sup.)	448
<i>Strongylium permodicum</i> Maklin -----	9 (Sup.)	449
<i>Synanthedon acerni</i> Clem. -----	9	417
<i>Synanthedon bibiopennis</i> Bdv. -----	4	132
<i>Syntomeida epialis</i> Walk. -----	2	52
	5	208
	6	305
<i>Systema blanda</i> Melsh. -----	5	184
	6	284
<i>Syrbula admirabilis</i> Uhl. -----	5 (Sup.)	223
<i>Tabanus</i> sp. -----	3	90
<i>Tachypterellus quadrigibbus</i> Say -----	4	115
	5	158, 178
	7	315
<i>Taeniothrips inconsequens</i> Uzel -----	2	32
	3	72
	4	119
<i>Taeniothrips gladioli</i> M. & S.		
<u>See</u> <i>T. simplex</i> Morison.		
<i>Taeniothrips simplex</i> Morison -----	1	19
	2	52
	6	304
	7	315, 349
	8	387
	9	395
<i>Taeniopoda varipennis</i> Rehn -----	9 (Sup.)	497
<i>Tarsonemus bancrofti</i> Michael -----	1	5, 8
<i>Tarsonemus floricolus</i> C. & F. -----	8	376
<i>Tarsonemus pallidus</i> Banks -----	7	334, 348
<i>Tarsonemus</i> sp. -----	8	376
<i>Tatua tatua</i> (Cuvier) -----	9 (Sup.)	490
<i>Tenthredinidae</i> -----	4	141
<i>Tetracnemus pretiosus</i> Timb. -----	1	11
<i>Tetraneuresta obscuriventris</i> Loew -----	9 (Sup.)	453
<i>Tetralopha robustella</i> Zell. -----	8	384
	9	417
<i>Tetramorium caespitum</i> L. -----	4	148
<i>Tetranychus sexmaculatus</i> Riley -----	3	75-76
	4	96, 123
<i>Tetranychus telarius</i> L. -----	1	17, 19
	2	30, 44
	3	62
	4	95, 104
	5	168
	6	261, 270 -271
	7	321-322
	9	415
<i>Thalassa glauca</i> (Muls.) -----	9 (Sup.)	446
<i>Thamnotettix comatus</i> (Ball) -----	9 (Sup.)	467
<i>Thamnotettix fasciaticollis</i> (Stal) -----	9 (Sup.)	468
<i>Thecodiplosis mosellana</i> Gehin -----	10	516
<i>Thrips panicus</i> Moul. -----	10	523

<i>Thrips tabaci</i> Lind. -----	1	14
	3	94
	4	131, 135
	5	193
	6	289, 291
	7	334
	8	374
	10	523
<i>Thylodrias contractus</i> Mots. -----	9	426
<i>Thyridopteryx ephemeraeformis</i> Haw. -----	2	47
	3	85
	6	237
	7	343
<i>Thysanoptera</i> -----	4	143
	5	198, 209
	6	295
	7	341
	9	420
	10	510, 523
<i>Tineola biselliella</i> Hum. -----	8	372
<i>Tineola uterella</i> Wlsm. -----	5	212
<i>Tipula cunctans</i> Say -----	3	65
<i>Tomaspis bicincta</i> Say -----	9 (Sup.)	455
<i>Tomaspis inca</i> (Guer.) -----	9 (Sup.)	455
<i>Tomaspis postica</i> (Walk.) -----	9 (Sup.)	455
<i>Tomaspis simulans</i> (Walk.) -----	9 (Sup.)	455
<i>Tortrix citrana</i> Fern. -----	4	122
<i>Tortrix pallorana</i> Rob. -----	6	262, 303
<i>Toumeyella liriiodendri</i> Gmel. -----	2	50
<i>Toumeyella numismaticum</i> Pettit & McDonald	4	140
<i>Toxoptera aurantiae</i> Boyer -----	9 (Sup.)	455
<i>Toxoptera graminum</i> Rond. -----	2	27, 31
<i>Toxotrypana curvicauda</i> Gerst. -----	1	11
	3	75
<i>Trachelus tabidus</i> F. -----	6	271-272
	8	360
	10	515, 535
<i>Tremex columba</i> L. -----	4	138
<i>Triatoma sanguisuga</i> Lec. -----	7	352
<i>Trichopoda pennipes</i> F. -----	9	406
<i>Trichogramma minutum</i> Riley -----	3	10
<i>Trichogramma</i> sp. -----	3	31
<i>Trichiocampus viminalis</i> Fall -----	6	353
	7	347
<i>Trifidaphis phaseoli</i> Pass. -----	4	134
<i>Trigona amalthea</i> (Oliv.) -----	9 (Sup.)	430
<i>Trigona cupira</i> Smith -----	9 (Sup.)	430
<i>Trigona townsendi</i> Okll. -----	9 (Sup.)	430
<i>Trimerotropis agrestis</i> McNeill -----	5 (Sup.)	235, 244
<i>Trimerotropis campestris</i> McNeill -----	5 (Sup.)	220, 228, 232, 242
<i>Trimerotropis formosus</i> Say -----	5 (Sup.)	221
<i>Trimerotropis laticincta</i> Sauss. -----	5 (Sup.)	220, 242, 243
<i>Trimerotropis pallidipennis</i> Burn. -----	5 (Sup.)	220, 232, 242, 243, 244, 245



<i>Trimerotropis pistrinaria</i> Sauss. -----	5 (Sup.)	256
<i>Trimerotropis sparsa</i> Thos. -----	5 (Sup.)	220, 221, 232
<i>Trimerotropis suffusus</i> Scudd. -----	5 (Sup.)	220
<i>Trimerotropis vinculata</i> Scudd. -----	5	163
	5 (Sup.)	248-250, 258
<i>Trogoderma</i> sp. -----	1	23
<i>Trogoderma versicolor</i> Creutz. -----	1	23
<i>Trombicula irritans</i> Riley -----	6	306
<i>Tuberculatus ulmifolii</i> Monell -----	6	300
	7	344
<i>Tyloderma fragariae</i> Riley -----	5	194
<i>Typhlocyba pomaria</i> McAtee -----	4	114
	8	364
<i>Umbonia crassicornis</i> (Amy. & Serv.) -----	9 (Sup.)	479
<i>Utetheisa bella</i> L. -----	7	325
	9	400
<i>Utetheisa ornatrix</i> (L.) -----	9 (Sup.)	493
<i>Vanduzee segmentata</i> . (Fowl.) -----	9 (Sup.)	479, 490
<i>Vitula serratilineella</i> Rag. -----	3	92
<i>Wasmannia auro-punctata</i> Roger -----	8	390
<i>Winthemia</i> sp. -----	9	423
<i>Xanthippus corallipes panthorinus</i> Scudd.-	6	266
<i>Xestocephalus tessellatus</i> Van D. -----	9 (Sup.)	468
<i>Xylastodoris luteolus</i> Barber -----	6	305
	8	387
<i>Xyloryctes satyrus</i> F. -----	6	298
<i>Xylotrechus quadrimaculatus</i> Hald. -----	7	343
<i>Zelus ruficeps</i> Stal -----	9 (Sup.)	442
<i>Zenillia mitis</i> Meig. -----	9 (Sup.)	503
<i>Zenillia roseanae</i> Br. & Berg. -----	9 (Sup.)	503
<i>Zeuzera pyrina</i> L. -----	4	137
<i>Zicca taeniola</i> (Dallas) -----	9 (Sup.)	489
<i>Zonosemata electa</i> Say -----	6	292
	7	335
<i>Zophodia grossulariae</i> Riley -----	4	120
<i>Zygogramma exclamationis</i> F. -----	7	350

We wish to urge our collaborators to use the common names accepted by the American Association of Economic Entomologists. They are indicated by the letters a.n.o. (americano nomina officinale).

Alder flea beetle a.n.o. -----	<i>Altica bimarginata</i> Say
Alfalfa caterpillar a.n.o. -----	<i>Eurymus eurytheme</i> (Bdv.)
Alfalfa looper a.n.o. -----	<i>Autographa californica</i> (Speyer)
Alfalfa weevil a.n.o. -----	<i>Hypera postica</i> (Gyll.)
American dog tick a.n.o. -----	<i>Dermacentor variabilis</i> (Say)
Angoumois grain moth a.n.o. -----	<i>Sitotroga cerealella</i> (Oliv.)
Apple curculio a.n.o. -----	<i>Tachypterellus quadrigibbus</i> (Say)
Apple flea weevil a.n.o. -----	<i>Orchestes pallicornis</i> Say
Apple grain aphid a.n.o. -----	<i>Rhopalosiphum prunifoliae</i> (Fitch)
Apple leaf skeletonizer a.n.o. -----	<i>Psorosina hammondi</i> (Riley)
Apple maggot a.n.o. -----	<i>Rhagoletis pomonella</i> (Walsh)
Arborvitae aphid -----	<i>Lachnus thujaefilina</i> Del Guer.
Arborvitae leaf miner a.n.o. -----	<i>Argyresthia thuiella</i> (Pack.)
Argentine ant a.n.o. -----	<i>Iridomyrmex humilis</i> Mayr
Army cutworm a.n.o. -----	<i>Chorizagrotis auxiliaris</i> (Grote)
Armyworm a.n.o. -----	<i>Cirphis unipuncta</i> (Haw.)
Artichoke plume moth a.n.o. -----	<i>Platyptilia carduidactyla</i> (Riley)
Asiatic garden beetle a.n.o. -----	<i>Autoserica castanea</i> (Arrow)
Asparagus beetle a.n.o. -----	<i>Crioceris asparagi</i> (L.)
Asparagus miner a.n.o. -----	<i>Agromyza simplex</i> Loew
Azalea lacebug -----	<i>Stephanitis pyrioides</i> Scott
Azalea scale -----	<i>Eriococcus azaleae</i> Comst.
Bagworm a.n.o. -----	<i>Thyridopteryx ephemeraeformis</i> (Haw.)
Balsam fir sawyer a.n.o. -----	<i>Monochamus marmorator</i> Kby.
Banded ash borer -----	<i>Neoclytus caprea</i> Say
Banded cucumber beetle a.n.o. -----	<i>Diabrotica balteata</i> Lec.
Bat bedbug -----	<i>Cimex pilosellus</i> Horv.
Beaked willow gall -----	<i>Phytophaga rigida</i> O. S.
Bean aphid a.n.o. -----	<i>Aphis rumicis</i> L.
Bean leaf beetle a.n.o. -----	<i>Cerotoma trifurcata</i> (Forst.)
Bean leaf roller a.n.o. -----	<i>Goniurus proteus</i> (L.)
Bean thrips a.n.o. -----	<i>Heliothrips fasciata</i> Perg.
Bedbug a.n.o. -----	<i>Cimex lectularius</i> L.
Beech scale a.n.o. -----	<i>Cryptococcus fagi</i> (Baer.)
Beet armyworm a.n.o. -----	<i>Laphygma exigua</i> (Hbr.)
Beet leafhopper a.n.o. -----	<i>Eutettix tenellus</i> (Bak.)
Beet webworm a.n.o. -----	<i>Loxostege sticticalis</i> (L.)
Bella moth -----	<i>Utetheisa bella</i> L.
Birch leaf miner -----	<i>Fenusa pumila</i> Klug.
Birch skeletonizer a.n.o. -----	<i>Bucculatrix canadensisella</i> Chamb.
Black blister beetle a.n.o. -----	<i>Epicauta pennsylvanica</i> (Deg.)
Black cherry aphid a.n.o. -----	<i>Myzus cerasi</i> (F.)
Black fungus beetle -----	<i>Alphitobius piceus</i> (Oliv.)
Black grain stem sawfly a.n.o. -----	<i>Trachelus tabidus</i> (F.)
Black pecan aphid a.n.o. -----	<i>Melanocallis caryaefoliae</i> (Davis)
Black scale a.n.o. -----	<i>Saissetia oleae</i> (Bern.)
Black vine weevil a.n.o. -----	<i>Brachyrhinus sulcatus</i> (F.)
Black widow spider a.n.o. -----	<i>Latrodectus mactans</i> (F.)
Bloodsucking conenose a.n.o. -----	<i>Triatoma sanguisuga</i> (Lec.)

Blunt-nosed leafhopper -----	<i>Euscelis striatulus</i> (Fall.)
Boll weevil a.n.o. -----	<i>Anthonomus grandis</i> Boh.
Bollworm a.n.o. -----	<i>Heliothis obsoleta</i> (F.)
Boxelder bug a.n.o. -----	<i>Leptocoris trivittatus</i> (Say)
Boxelder leaf roller a.n.o. -----	<i>Gracilaria negundella</i> Chamb.
Boxwood leaf miner a.n.o. -----	<i>Monarthropalpus buxi</i> Laboulb.
Bronzed birch borer a.n.o. -----	<i>Agrilus anxius</i> Gory
Brown dog tick a.n.o. -----	<i>Rhipicephalus sanguinius</i> Latr.
Brown salt-marsh mosquito a.n.o. -----	<i>Aedes cantator</i> (Coq.)
Brown spider beetle a.n.o. -----	<i>Ptinus brunneus</i> Dufts.
Brown-tail moth a.n.o. -----	<i>Nygmia phaeorrhoea</i> (Donov.)
Buck moth a.n.o. -----	<i>Hemileuca maia</i> (Drury)
Buffalo treehopper a.n.o. -----	<i>Ceresa bubalus</i> (F.)
Bulb mite a.n.o. -----	<i>Rhizoglyphus hyacinthi</i> Bdv.
Cabbage aphid a.n.o. -----	<i>Brevicoryne brassicae</i> (L.)
Cabbage curculio a.n.o. -----	<i>Ceutorhynchus rapae</i> Gyll.
Cabbage looper a.n.o. -----	<i>Autographa brassicae</i> (Riley)
Cabbage maggot a.n.o. -----	<i>Hylemyia brassicae</i> (Bouche)
Cabbage webworm a.n.o. -----	<i>Hellula undalis</i> (F.)
California oak worm a.n.o. -----	<i>Phryganidia californica</i> Pack.
California red scale a.n.o. -----	<i>Chrysomphalus aurantii</i> (Mask.)
Camellia scale -----	<i>Lepidosaphes camelliae</i> Hoke
Carpenter worm a.n.o. -----	<i>Prionoxystus robiniae</i> (Peck)
Carpet beetle a.n.o. -----	<i>Anthrenus scrophulariae</i> (L.)
Carrot beetle a.n.o. -----	<i>Ligyrus gibbosus</i> (Deg.)
Carrot rust fly a.n.o. -----	<i>Psila rosae</i> (F.)
Carrot weevil a.n.o. -----	<i>Listronotus latiusculus</i> (Boh.)
Catalpa sphinx a.n.o. -----	<i>Ceratonia catalpae</i> (Bdv.)
Cecropia moth a.n.o. -----	<i>Platysamia cecropia</i> (L.)
Cedar bark beetle -----	<i>Phloeosinus dentatus</i> (Say)
Chaff scale a.n.o. -----	<i>Parlatoria pergandii</i> Comst.
Chain-spotted geometer a.n.o. -----	<i>Cingilia catenaria</i> (Drury)
Changa a.n.o. -----	<i>Scapteriscus vicinus</i> Scudd.
Cherry casebearer a.n.o. -----	<i>Coleophora pruniella</i> Clem.
Cherry fruitfly a.n.o. -----	<i>Rhagoletis cingulata</i> (Loew)
Cherry fruitworm a.n.o. -----	<i>Grapholitha packardi</i> Zell.
Cherry leaf beetle a.n.o. -----	<i>Galerucella cavicollis</i> (Lec.)
Chigger a.n.o. -----	<i>Trombicula irritans</i> (Riley)
Chinch bug a.n.o. -----	<i>Blissus leucopterus</i> (Say)
Chrysanthemum leaf miner a.n.o. -----	<i>Phytomyza chrysanthemi</i> (Kowarz)
Cigarette beetle a.n.o. -----	<i>Lasioderma serricorne</i> (F.)
Citrus mealybug a.n.o. -----	<i>Pseudococcus citri</i> (Risso)
Citrus red mite a.n.o. -----	<i>Paratetranychus citri</i> McG.
Citrus rust mite a.n.o. -----	<i>Phyllocoptes oleivorus</i> Ashm.
Citrus thrips a.n.o. -----	<i>Scirtothrips citri</i> (Moult.)
Citrus whitefly a.n.o. -----	<i>Dialeurodes citri</i> Ashm.
Cloudless sulphur -----	<i>Catopsilia eubule</i> L.
Clover leaf weevil a.n.o. -----	<i>Hypera punctata</i> (F.)
Clover mite a.n.o. -----	<i>Bryobia praetiosa</i> Koch
Clover root borer a.n.o. -----	<i>Hylastinus obscurus</i> (Marshall)
Cluster fly a.n.o. -----	<i>Pollenia rudis</i> (F.)
Codling moth a.n.o. -----	<i>Carpocapsa pomonella</i> L.
Colorado potato beetle a.n.o. -----	<i>Leptinotarsa decemlineata</i> (Say)



Common red spider a.n.o. -----	<i>Tetranychus telarius</i> (L.)
Convergent ladybeetle a.n.o. -----	<i>Hippodamia convergens</i> Guer.
Corn ear worm a.n.o. -----	<i>Heliothis obsoleta</i> (F.)
Corn flea beetle a.n.o. -----	<i>Chaetocnema pulicaria</i> Melsh.
Corn lantern fly -----	<i>Peregrinus maidis</i> (Ashm.)
Corn leaf aphid a.n.o. -----	<i>Aphis maidis</i> Fitch
Corn root webworm a.n.o. -----	<i>Crambus caliginosellus</i> Clem.
Corn root worm a.n.o. -----	<i>Diabrotica longicornis</i> (Say)
Corn sap beetle a.n.o. -----	<i>Carpophilus dimidiatus</i> (F.)
Cotton aphid a.n.o. -----	<i>Aphis gossypii</i> Glov.
Cotton blister mite a.n.o. -----	<i>Eriophyes gossypii</i> Banks
Cotton flea hopper a.n.o. -----	<i>Psallus seriatus</i> (Reut.)
Cotton leaf perforator a.n.o. -----	<i>Bucculatrix thurberiella</i> Busck
Cotton leaf worm a.n.o. -----	<i>Alabama argillacea</i> (Hbn.)
Cottony-cushion scale a.n.o. -----	<i>Icerya purchasi</i> Mask.
Cottony maple scale a.n.o. -----	<i>Pulvinaria vitis</i> (L.)
Cottony pine scale -----	<i>Pseudophilippa quaintancii</i> Ckll.
Coulee cricket a.n.o. -----	<i>Peranabrus scabricollis</i> (Thos.)
Cowpea curculio a.n.o. -----	<i>Chalcodermus aeneus</i> Boh.
Cowpea weevil a.n.o. -----	<i>Callosobruchus maculatus</i> (F.)
Cranberry fruitworm a.n.o. -----	<i>Mineola vaccinii</i> (Riley)
Crapemyrtle aphid a.n.o. -----	<i>Myzocallis kahawaluokalani</i> Kirk.
Cuban-laurel thrips a.n.o. -----	<i>Gynaikothrips uzeli</i> (Zimm.)
Currant stem girdler a.n.o. -----	<i>Janus integer</i> (Wort.)
Cyclamen mite a.n.o. -----	<i>Tarsonemus pallidus</i> Banks
Deer botfly -----	<i>Cephenomyia pratti</i> Hunter
Deodar weevil a.n.o. -----	<i>Pissodes nemorensis</i> Germ.
Desert corn flea beetle a.n.o. -----	<i>Chaetocnema ectypa</i> Horn
Diamondback moth a.n.o. -----	<i>Plutella maculipennis</i> (Curt.)
Dog flea a.n.o. -----	<i>Ctenocephalides canis</i> (Curt.)
Dogwood club gall -----	<i>Lasioptera clavula</i> Beutm.
Douglas fir caterpillar -----	<i>Euschastia argentata</i> Pack.
Dried fruit beetle a.n.o. -----	<i>Carpophilus hemipterus</i> (L.)
Dried fruit moth a.n.o. -----	<i>Vitula serratilineella</i> Raf.
Ear tick a.n.o. -----	<i>Ornithodoros megnini</i> Duges
Eastern lubber grasshopper a.n.o. -----	<i>Rumex microptera</i> (Beauv.)
Eastern spruce beetle a.n.o. -----	<i>Dendroctonus piceaperda</i> Hopk.
Eastern tent caterpillar a.n.o. -----	<i>Malacosoma americanum</i> (F.)
Eggplant lacebug a.n.o. -----	<i>Gargaphia solani</i> Heid.
Eggplant tortoise beetle -----	<i>Grotiana pallidula</i> (Boh.)
Elm bud gall -----	<i>Dasyneura ulmea</i> Felt
Elm bud mite -----	<i>Phytoptus ulmi</i> Beutm.
Elm cockscomb gall a.n.o. -----	<i>Colopha ulmicola</i> (Fitch)
Elm leaf beetle a.n.o. -----	<i>Galerucella xanthomelaena</i> (Schr.)
Euonymus scale a.n.o. -----	<i>Chionaspis euonymi</i> Comst.
European corn borer a.n.o. -----	<i>Pyrausta nubilalis</i> (Hbn.)
European earwig a.n.o. -----	<i>Forficula auricularia</i> L.
European elm scale a.n.o. -----	<i>Gossyparia spuria</i> (Mod.)
European fruit lecanium a.n.o. -----	<i>Lecanium corni</i> Bouche
European honeysuckle leaf roller -----	<i>Cerostoma xylostella</i> L.
European pine shoot moth a.n.o. -----	<i>Rhyacionia bouliana</i> (Schiff.)
European red mite a.n.o. -----	<i>Paratetranychus pilosus</i> (C. & F.)

European spruce sawfly a.n.o. -----	Diprion polytomum (Htg.)
European wheat midge -----	Thecodiplosis mosellana Gehin
European wheat stem sawfly a.n.o. ---	Cephus pygmaeus (L.)
European willow leaf beetle -----	Plagiodera versicolora Laich.
Eye-spotted budmoth a.n.o. -----	Spilonota ocellana (D. & S.)
Fall armyworm a.n.o. -----	Laphygma frugiperda (S. & A.)
Fall cankerworm a.n.o. -----	Alsophila pometaria (Harr.)
Fall webworm a.n.o. -----	Hyphantria cunea (Drury)
False chinch bug a.n.o. -----	Nysius ericae (Schill.)
Fern scale a.n.o. -----	Hemichionaspis aspidistrae (Sign.)
Field cricket a.n.o. -----	Gryllus assimilis F.
Flatheaded apple tree borer a.n.o. --	Chrysobothris femorata (Oliv.)
Florida red scale a.n.o. -----	Chrysomphalus aonidum (L.)
Follicle mite -----	Demodex folliculorum Simon
Forest tent caterpillar a.n.o. -----	Malacosoma disstria Hbn.
Four-lined plant bug a.n.o. -----	Poecilocapsus lineatus (F.)
Four-spotted tree cricket a.n.o. ----	Oecanthus nigricornis quadripunctatus Beut.
Frosted scale -----	Lecanium prunosum Coq.
Fruit tree leaf roller a.n.o. -----	Cacoecia argyrospila (Walk.)
Furniture carpet beetle -----	Anthrenus vorax Wtrh.
Garden centipede a.n.o. -----	Scutigera immaculata (Newp.)
Garden flea hopper a.n.o. -----	Halticus citri (Ashm.)
Garden webworm a.n.o. -----	Loxostege similalis (Guen.)
Gladiolus thrips a.n.o. -----	Taeniothrips simplex Morison
Gloomy scale a.n.o. -----	Chrysomphalus tenebricosus (Comst.)
Golden tortoise beetle a.n.o. -----	Metritona bicolor (F.)
Gooseberry fruitworm a.n.o. -----	Zophodia grossulariae (Riley)
Granary weevil a.n.o. -----	Sitophilus granaria (L.)
Grape berry moth a.n.o. -----	Polychrosis viteana (Clem.)
Grape leaf folder a.n.o. -----	Desmia funeralis (Hbn.)
Grape leafhopper a.n.o. -----	Erythroneura comes (Say)
Grape plume moth a.n.o. -----	Oxyptilus periscelidactylus (Fitch)
Grape root borer a.n.o. -----	Paranthrene polistiformis (Harr.)
Grape root worm a.n.o. -----	Fidia viticida Walsh
Grape sawfly a.n.o. -----	Erythraspides pygmaea (Say)
Grape tomato gall -----	Lasiopteryx vitis O. S.
Great Basin wireworm a.n.o. -----	Ludius pruininus noxius Hyslop
Green bug a.n.o. -----	Toxoptera graminum Rond.
Green citrus aphid -----	Aphis spiraeicola Patch
Greenhouse leaf tier a.n.o. -----	Phlyctaenia rubigalis (Guen.)
Green June beetle a.n.o. -----	Cotinis nitida (L.)
Green peach aphid a.n.o. -----	Myzus persicae (Sulz.)
Green stinkbug a.n.o. -----	Acrosternum hilaris (Say)
Green-striped maple worm a.n.o. -----	Anisota rubicunda F.
Ground mealybug a.n.o. -----	Rhizoecus terrestris (Newst.)
Gulf coast fritillary -----	Dione vanillae L.
Gulf coast tick a.n.o. -----	Amblyomma maculatum Koch
Gypsy moth a.n.o. -----	Porthetia dispar (L.)
Hackberry bud gall -----	Pachypsylla gemma Riley
Hackberry butterfly -----	Chlorippe celtis Bdv. & Lec.
Hairy chinch bug a.n.o. -----	Blissus hirtus Montd.



Harlequin bug a.n.o. -----	Murgantia histrionica (Hahn)
Hawaiian beet webworm a.n.o. -----	Hymenia fascialis (Cram.)
Hemispherical scale a.n.o. -----	Saissetia hemisphaerica (Targ.)
Hemlock looper a.n.o. -----	Ellopiia fiscellaria Guen.
Hessian fly a.n.o. -----	Phytophaga destructor (Say)
Hickory nut curculio -----	Conotrachelus affinis Boh.
Hickory phylloxera -----	Phylloxera caryaecaulis Fitch
Hickory shuck worm a.n.o. -----	Laspeyresia caryana (Fitch)
Hide beetle a.n.o. -----	Dermestes vulpinus F.
Holly fireworm -----	Rhopobota naevana ilicifolia <sup>Kearf.</sup>
Hop aphid a.n.o. -----	Phorodon humuli (Schr.)
Hornfly a.n.o. -----	Haematobia irritans L.
Horse botfly a.n.o. -----	Gastrophilus intestinalis Deg.
House cricket a.n.o. -----	Gryllus domesticus L.
Human flea a.n.o. -----	Pulex irritans L.
Imbricated snout beetle a.n.o. -----	Epicaerus imbricatus (Say)
Imported cabbage worm a.n.o. -----	Ascia rapae (L.)
Imported currant worm a.n.o. -----	Pteronidea ribesii (Scop.)
Indian-meal moth a.n.o. -----	Plodia interpunctella (Hbn.)
Japanese beetle a.n.o. -----	Popillia japonica Newm.
Juniper webworm -----	Dichomeris marginellus F.
Larch casebearer a.n.o. -----	Coleophora laricella Hbn.
Larch sawfly a.n.o. -----	Lygaeonematus erichsonii (Htg.)
Larder beetle a.n.o. -----	Dermestes lardarius L.
Leaf crumpler a.n.o. -----	Mineola indigenella (Zell.)
Leaf-footed bug a.n.o. -----	Leptoglossus phyllopus (L.)
Leopard moth a.n.o. -----	Zeuzera pyrina (L.)
Lesser apple worm a.n.o. -----	Laspeyresia prunivora (Walsh)
Lesser cornstalk borer a.n.o. -----	Elasmopalpus lignosellus (Zell.)
Lesser peach borer a.n.o. -----	Synanthedon pictipes (G. & R.)
Lilac borer a.n.o. -----	Podosesia syringae (Harr.)
Lilac leaf miner a.n.o. -----	Gracilaria syringella F.
Lima bean pod borer a.n.o. -----	Etiella zinckenella (Treit.)
Lima bean vine borer a.n.o. -----	Monoptilota pergratialis (Hulst)
Lime-tree looper a.n.o. -----	Erannis tiliaria (Harr.)
Linden borer a.n.o. -----	Saperda vestita Say
Linden wart gall -----	Cecidomyia verrucicola O.S.
Locust borer a.n.o. -----	Cyllene robiniae (Forst.)
Locust mite -----	Eutrombidium trigonum Hermann
Locust twig borer -----	Ecdytolopha insiticiaria Zell.
Lone star tick a.n.o. -----	Amblyomma americanum (L.)
Magnolia scale a.n.o. -----	Neolecanium cornuparvum (Thro)
Meadow plant bug a.n.o. -----	Miris dolabratus (L.)
Melon aphid a.n.o. -----	Aphis gossypii Glov.
Melonworm a.n.o. -----	Diaphania hyalinata (L.)
Mexican bean beetle a.n.o. -----	Epilachna varivestis Muls.
Mexican mealybug a.n.o. -----	Phenacoccus gossypii Towns. & Ckll.
Mint flea beetle -----	Longitarsus waterhousei Kutsch
Monarch butterfly a.n.o. -----	Danaus menippe (Hbn.)
Mormon cricket a.n.o. -----	Anabrus simplex Hald.



Mountain ash sawfly -----	<i>Pristiphora geniculata</i> Htg.
Mourning-cloak butterfly a.n.o. -----	<i>Hamadryas antiopa</i> (L.)
Nantucket pine shoot moth -----	<i>Rhyacionia frustrana</i> Comst.
Navel orange worm a.n.o. -----	<i>Myelois venipars</i> Dyar
New York weevil a.n.o. -----	<i>Ithycerus noveboracensis</i> (Forst.)
Northern mole cricket a.n.o. -----	<i>Gryllotalpa hexadactyla</i> Perty
Nuttall's blister beetle a.n.o. -----	<i>Lytta nuttalli</i> Say
Oak pill gall -----	<i>Cincticornia pilulae</i> Walsh
Oak spangle gall -----	<i>Cecidomyia poculum</i> O.S.
Oblique-banded leaf roller a.n.o. -----	<i>Cacoecia rosaceana</i> (Harr.)
Obscure scale a.n.o. -----	<i>Chrysomphalus obscurus</i> (Comst.)
Oleander caterpillar -----	<i>Syntomeida epilais</i> Walk.
Oleander scale a.n.o. -----	<i>Aspidiotus hederæ</i> (Vallot)
Olive scale -----	<i>Parlatoria oleæ</i> Colv.
Onion maggot a.n.o. -----	<i>Hylemyia antiqua</i> Meig.
Onion thrips a.n.o. -----	<i>Thrips tabaci</i> Lind.
Orange tortrix a.n.o. -----	<i>Argyrotaenia citrana</i> (Fern.)
Oriental fruit moth a.n.o. -----	<i>Grapholitha molesta</i> Busck
Oystershell scale a.n.o. -----	<i>Lepidosaphes ulmi</i> (L.)
Pacific coast wireworm a.n.o. -----	<i>Limoniæ canus</i> Lec.
Pale-striped flea beetle a.n.o. -----	<i>Systema blanda</i> Melsh.
Pale western cutworm a.n.o. -----	<i>Porosagrotis orthogonia</i> (Morr.)
Pales weevil a.n.o. -----	<i>Hylobius pales</i> (Hbst.)
Pea aphid a.n.o. -----	<i>Illinoia pisi</i> (Kltb.)
Pea moth a.n.o. -----	<i>Laspeyresia nigricana</i> (Steph.)
Pea weevil a.n.o. -----	<i>Bruchus pisorum</i> (L.)
Peach borer a.n.o. -----	<i>Conopia exitiosa</i> (Say)
Peach twig borer a.n.o. -----	<i>Anarsia lineatella</i> Zell.
Pear midge a.n.o. -----	<i>Contarinia pyrivora</i> (Riley)
Pear psylla a.n.o. -----	<i>Psyllia pyricola</i> (Foerst.)
Pear thrips a.n.o. -----	<i>Taeniothrips inconsequens</i> (Uzel)
Pecan leaf casebearer a.n.o. -----	<i>Acrobasis juglandis</i> (LeB.)
Pecan nut casebearer a.n.o. -----	<i>Acrobasis caryæ</i> Grote
Pecan weevil a.n.o. -----	<i>Curculio caryæ</i> (Horn)
Pepper maggot -----	<i>Zonosemata electa</i> Say
Pepper weevil a.n.o. -----	<i>Anthonomus eugenii</i> Cano
Periodical cicada a.n.o. -----	<i>Magicicada septendecim</i> (L.)
Phlox bug -----	<i>Lopidea davisii</i> Knight
Pickleworm a.n.o. -----	<i>Diaphania nitidalis</i> (Stoll)
Pigeon tremex a.n.o. -----	<i>Tremex columba</i> (L.)
Pine bark aphid a.n.o. -----	<i>Pineus strobi</i> Htg.
Pine needle scale a.n.o. -----	<i>Chionaspis pinifoliae</i> (Fitch)
Pink bollworm a.n.o. -----	<i>Pectinophora gossypiella</i> (Saund.)
Pitch-mass borer -----	<i>Parharmonia pini</i> Kellicott
Plum curculio a.n.o. -----	<i>Conotrachelus nemophar</i> (Hbst.)
Polka-dot wasp moth -----	<i>Syntomeida epialis</i> Walk.
Poplar and willow borer a.n.o. -----	<i>Cryptorhynchus lapathi</i> (L.)
Poplar leaf beetle -----	<i>Phytodecta pallida</i> L.
Poplar sawfly -----	<i>Trichiocampus viminalis</i> Fall.
Poplar vagabond aphid a.n.o. -----	<i>Mordwilkoja vagabunda</i> (Walsh)
Potato aphid a.n.o. -----	<i>Illinoia solanifoliae</i> (Ashm.)

Potato flea beetle a.n.o. -----	<i>Epitrix cucumeris</i> Harr.
Potato leafhopper a.n.o. -----	<i>Emmonasca fabae</i> (Harr.)
Potato psyllid -----	<i>Paratrioza cockerelli</i> Sulc.
Potato tuber worm a.n.o. -----	<i>Gnorimoschema operculella</i> (Zell.)
Purple scale a.n.o. -----	<i>Lepidosaphes beckii</i> (Newm.)
Puss caterpillar a.n.o. -----	<i>Megalopyge opercularis</i> S. & A.
Putnam's scale a.n.o. -----	<i>Apsidiotus ancylus</i> (Putn.)
Quince curculio a.n.o. -----	<i>Conotrachelus crataegi</i> Walsh
Raisin moth a.n.o. -----	<i>Ephestia figulilella</i> Greg.
Raspberry cane borer a.n.o. -----	<i>Oberea bimaculata</i> (Oliv.)
Raspberry fruitworm a.n.o. -----	<i>Eyturus unicolor</i> Say
Raspberry root borer a.n.o. -----	<i>Bombicia marginata</i> (Harr.)
Raspberry sawfly a.n.o. -----	<i>Monophadnoides rubi</i> (Harr.)
Red-banded leaf roller a.n.o. -----	<i>Argyrotaenia velutinana</i> Walk.
Red-humped caterpillar a.n.o. -----	<i>Schizura concinna</i> (S. & A.)
Red-legged flea beetle a.n.o. -----	<i>Derocrepis erythropus</i> (Melsh.)
Red-necked cane borer a.n.o. -----	<i>Agrilus ruficollis</i> (F.)
Red turnip beetle a.n.o. -----	<i>Entomoscelis adonidis</i> (Pallas)
Rhododendron lacebug a.n.o. -----	<i>Stephanitis rhododendri</i> Horv.
Rhododendron whitefly -----	<i>Dialeurodes chittendeni</i> Laing
Rhubarb curculio a.n.o. -----	<i>Lixus concavus</i> Say
Rice weevil a.n.o. -----	<i>Sitophilus oryzae</i> (L.)
Rocky Mountain spotted-fever tick -----	<i>Dermacentor andersoni</i> Stiles
Rose chafer a.n.o. -----	<i>Macrodactylus subspinosus</i> (F.)
Rose curculio a.n.o. -----	<i>Rhynchites bicolor</i> (F.)
Rose leaf beetle a.n.o. -----	<i>Nodonota puncticollis</i> Say
Rose midge a.n.o. -----	<i>Dasyneura rhodophaga</i> (Coq.)
Rose sawfly a.n.o. -----	<i>Coliropa aethiops</i> (F.)
Rosy apple aphid a.n.o. -----	<i>Anuraphis roseus</i> (Baker)
Roundheaded apple tree borer a.n.o. -----	<i>Saperda candida</i> F.
Royal palm bug -----	<i>Xylastodoris luteolus</i> Barber
Rusty plum aphid a.n.o. -----	<i>Hysteroneura setariae</i> (Thos.)
Saddleback caterpillar a.n.o. -----	<i>Sibine stimulea</i> (Clem.)
Salt-marsh caterpillar a.n.c. -----	<i>Estigmene acraea</i> (Drury)
Sand wireworm a.n.o. -----	<i>Horistonotus uhlerii</i> Horn
San Jose scale a.n.o. -----	<i>Aspidiotus perniciosus</i> Comst.
Satin moth a.n.o. -----	<i>Stilpnotia salicis</i> (L.)
Saw-toothed grain beetle a.n.o. -----	<i>Oryzaephilus surinamensis</i> (L.)
Say's blister beetle a.n.o. -----	<i>Pomphopoea sayi</i> Lec.
Say's stinkbug a.n.o. -----	<i>Chlorochroa sayi</i> Stal
Scotch pine scale -----	<i>Toumeyella numismaticus</i> Pettit & McDaniel
Screwworm a.n.o. -----	<i>Cochliomyia americana</i> C. & P.
Seed-corn maggot a.n.o. -----	<i>Hylemyia cilicrura</i> Rond.
Sheep ked -----	<i>Melophagus ovinus</i> L.
Short-nosed cattle louse a.n.o. -----	<i>Haematopinus eurysternus</i> Nitz.
Shot-hole borer a.n.o. -----	<i>Scolytus rugulosus</i> Ratz.
Silverfish a.n.o. -----	<i>Lepisma saccharina</i> L.
Six-spotted mite a.n.o. -----	<i>Tetranychus sexmaculatus</i> Riley
Smaller European elm bark beetle a.n.o. -----	<i>Scolytus multistriatus</i> Marsham
Snowy tree cricket a.n.o. -----	<i>Oecanthus niveus</i> (Deg.)
Southern armyworm a.n.o. -----	<i>Prodenia eridania</i> (Cram.)



Southern beet webworm a.n.o. -----	<i>Pachyzancla bipunctalis</i> (F.)
Southern cabbage worm a.n.o. -----	<i>Ascia protodice</i> (Bdv. & Lec.)
Southern corn leaf beetle -----	<i>Myochrous denticollis</i> Say
Southern green stinkbug a.n.o. -----	<i>Nezara viridula</i> (L.)
Southern mole cricket a.n.o. -----	<i>Scapteriscus acletus</i> R. & H.
Southern pine beetle a.n.o. -----	<i>Dendroctonus frontalis</i> Zimm.
Southwestern corn borer a.n.o. -----	<i>Diatraea grandiosella</i> Dyar
Spinach leaf miner a.n.o. -----	<i>Pegomyia hyoscyami</i> Panz
Spindleworm -----	<i>Achatodes zeae</i> Harr.
Spirea aphid -----	<i>Aphis spiraeicola</i> Patch
Spotted cucumber beetle a.n.o. -----	<i>Diabrotica duodecimpunctata</i> (F.)
Spring cankerworm a.n.o. -----	<i>Paleacrita vernata</i> (Peck)
Spruce budworm a.n.o. -----	<i>Cacoecia fumiferana</i> (Clem.)
Spruce gall aphid -----	<i>Chermes abietis</i> L.
Spruce mite -----	<i>Paratetranychus uniunguis</i> Jacobi
Squash beetle a.n.o. -----	<i>Epilachna borealis</i> (F.)
Squash borer a.n.o. -----	<i>Melittia satyriniformis</i> Hbn.
Squash bug a.n.o. -----	<i>Anasa tristis</i> (Deg.)
Stablefly a.n.o. -----	<i>Stomoxys calcitrans</i> (L.)
Stalk borer a.n.o. -----	<i>Papaipema nebris nitela</i> (Guen.)
Strawberry leaf roller a.n.o. -----	<i>Ancyliis comptana</i> (Froel.)
Strawberry root aphid a.n.o. -----	<i>Aphis forbesi</i> Weed
Strawberry weevil a.n.o. -----	<i>Anthonomus signatus</i> Say
Striped blister beetle a.n.o. -----	<i>Epicauta vittata</i> F.
Striped cucumber beetle a.n.o. -----	<i>Diabrotica vittata</i> (F.)
Striped flea beetle a.n.o. -----	<i>Phyllotreta vittata</i> (F.)
Suckfly a.n.o. -----	<i>Dicyphus minimus</i> Uhl.
Sugar beet wireworm a.n.o. -----	<i>Limonium californicus</i> (Mann.)
Sugarcane beetle a.n.o. -----	<i>Eutheola rugiceps</i> (Lec.)
Sugarcane borer a.n.o. -----	<i>Diatraea saccharalis</i> (F.)
Sugarcane rootstock weevil -----	<i>Anacentrinus subnudus</i> Buchanan
Sunflower beetle a.n.o. -----	<i>Zygogramma exclamationis</i> (F.)
Sunflower weevil -----	<i>Rhodobaenus tredecimpunctatus</i> Ill.
Sweetpotato sawfly -----	<i>Sterictophora cellularis</i> Say
Sweetpotato weevil a.n.o. -----	<i>Cylas formicarius</i> (F.)
Sycamore lacebug -----	<i>Corythucha ciliata</i> Say
Sycamore scale -----	<i>Stomacoccus platani</i> Ferris
Tarnished plant bug a.n.o. -----	<i>Lygus pratensis</i> (L.)
Tea scale -----	<i>Fiorinia theae</i> Green
Terrapin scale a.n.o. -----	<i>Lecanium nigrofasciatum</i> Perg.
Three-lined potato beetle a.n.o. -----	<i>Lema trilineata</i> (Oliv.)
Thurberia weevil a.n.o. -----	<i>Anthonomus grandis thurberiae</i> Pierce
Tobacco budworm a.n.o. -----	<i>Heliothis virescens</i> (F.)
Tobacco flea beetle a.n.o. -----	<i>Epitrix parvula</i> (F.)
Tomato pinworm a.n.o. -----	<i>Gnorimoschema lycopersicella</i> (Busck)
Tomato stiltbug -----	<i>Jalysus spinosus</i> Say
Tomato worm a.n.o. -----	<i>Protoparce sexta</i> (Johan.)
Tropical rat mite a.n.o. -----	<i>Liponyssus bacoti</i> (Hirst)
Tuliptree scale a.n.o. -----	<i>Toumeyella liriodendri</i> (Gmel.)
Turnip aphid a.n.o. -----	<i>Rhopalosiphum pseudobrassicæ</i> (Davis)
Twice-stabbed ladybeetle a.n.o. -----	<i>Chilocorus bivulnerus</i> Muls.
Twig girdler a.n.o. -----	<i>Oncideres cingulatus</i> (Say)
Twig pruner a.n.o. -----	<i>Hypermallus villosus</i> (F.)
Two-lined chestnut borer a.n.o. -----	<i>Agilus bilineatus</i> (Web.)



Two-marked treehopper -----	<i>Enchenopa binotata</i> Say
Ugly nest caterpillar a.n.o. -----	<i>Cacoecia cerasivorana</i> (Fitch)
Varied carpet beetle a.n.o. -----	<i>Anthrenus verbasci</i> (L.)
Variegated cutworm a.n.o. -----	<i>Lycophotia margaritosa saucia</i> Hbn.
Vedalia a.n.o. -----	<i>Modolia cardinalis</i> (Muls.)
Vegetable weevil a.n.o. -----	<i>Eistroderes obliquus</i> Klug
Velvetbean caterpillar a.n.o. -----	<i>Anticarsia gemmatilis</i> (Hbn.)
Vetch bruchid a.n.o. -----	<i>Bruchus brachialis</i> Fahraeus
Walnut caterpillar a.n.o. -----	<i>Datana integerrima</i> G. & R.
Waterlily leaf beetle -----	<i>Galerucella nymphaeae</i> L.
Webbing clothes moth a.n.o. -----	<i>Tineola biselliella</i> (Hum.)
Western cabbage flea beetle -----	<i>Phyllotreta pusilla</i> Horn
Western chinch bug a.n.o. -----	<i>Blissus occiduus</i> Barber
Western field wireworm a.n.o. -----	<i>Limonius infuscatus</i> Mots.
Western grape skeletonizer a.n.o. -----	<i>Harrisina brillians</i> B. & McD.
Western potato flea beetle a.n.o. -----	<i>Epitrix subcrinita</i> Lec.
Western spotted cucumber beetle a.n.o. ---	<i>Diabrotica soror</i> Lec.
Wheat jointworm a.n.o. -----	<i>Harmolita tritici</i> (Fitch)
Wheat midge a.n.o. -----	<i>Contarinia tritici</i> (Kby.)
Wheat stem maggot a.n.o. -----	<i>Meromyza americana</i> Fitch
Wheat stem sawfly a.n.o. -----	<i>Cephus cinctus</i> Nort.
White-marked tussock moth a.n.o. -----	<i>Hemerocampa leucostigma</i> (S. & A.)
White peach scale a.n.o. -----	<i>Aulacaspis pentagona</i> (Targ.)
White-pine aphid -----	<i>Cinara strobi</i> Fitch
White-pine weevil a.n.o. -----	<i>Pissodes strobi</i> (Peck)
Willow sawfly a.n.o. -----	<i>Pteronidea ventralis</i> (Say)
Woolly beech aphid -----	<i>Phyllaphis fagi</i> L.
Woolly elm aphid a.n.o. -----	<i>Eriosoma americanum</i> Riley
Yellow-headed spruce sawfly a.n.o. -----	<i>Pachynematus ocreatus</i> Hgtn.
Yellow woolly bear a.n.o. -----	<i>Diacrisia virginica</i> (F.)
Zebra caterpillar a.n.o. -----	<i>Mamestra picta</i> Harr.



















